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Minnesota Medicine

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No. 2

THE EARLY YEARS OF ANDREAS VESALIUS

JOHN F. FULTON, M.D.

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New Haven, Connecticut

Preliminary Remarks

I count it a special privilege to be invited to address the members of the Ramsey County Medical Society on the occasion of the fiftieth anniversary of its library, for I have an abiding interest in medical libraries and firmly believe in the importance of their potential contribution to the medical profession; not only this, but I have a particular familial interest in this library since in the early days my father was one of its more ardent advocates, and my uncle, Dr. Charles Wheaton, was also a staunch supporter. Thus if I were not interested in it myself, I should be guilty of filial disrespect.

Father, who was president of the Ramsey County Society in 1893 and of the State Association in 1897-98, had settled in Saint Paul in 1882, and there is one inno-

vation which he introduced in the state of which my family have always been especially proud. In 1884 the dean of the Minnesota College Hospital announced that the professor of ophthalmology and otology would "give a free clinic on diseases of the eye and ear at the college building upon each Friday, and that all indigent afflicted are invited to avail themselves of the attention now for the first time in the history of our state offered them."* This, I believe, marked the beginning of dispensary service in Minnesota. Father always contended that he learned more about ophthalmology from his dispensary than he did from his office practice. As a result, he was at all times very insistent that young medical graduates should make a point of giving some part of their time to dispensary practice.

ANDREAS VESALIUS

SIR William Osler always maintained that no medical library could possibly afford to be without a copy of the great masterpiece of anatomy, the *Fabrica* of Andreas Vesalius published in 1543. So successful was his teaching that few libraries can now afford to have one, if they didn't acquire it before Osler's rapidly multiplying progeny of medical book collectors were turned loose upon an unsuspecting world.

There is just reason, however, for Osler's contention about the importance of the *Fabrica* since there are few parallels in history to the prodigious

and precocious labors of the restless young Belgian whom the late Edward Streeter used to call "the redhaired man of wrath." Like his distinguished Roman predecessor, Galen, Vesalius was incredibly industrious, but he was also vain, short-tempered, and must have been anything but comfortable to live with. Indeed, he once said that anyone who would follow the medical profession must not take unto himself a wife.

Born at the turn of the year 1514-1515 of an English mother, Isabella Crabbe, and a pharmacist father (also named Andreas Vesalius), who was descended from a long line of physicians, Andreas the younger exhibited signs of precocity early in life, and it is recorded that before the age of ten he began to collect objects of natural history and to dissect rats and moles; later he devel-

*Read at the fiftieth anniversary celebration of the Ramsey County Medical Society Library, Saint Paul, Minnesota, September 23, 1947.

*Northwestern Lancet, 3:183, (May 15) 1884. See also R. O. Beard's "The History of Medical Education in the State of Minnesota" in *The Unification of Medical Teaching in the State of Minnesota. An Historical Evening*. December 8, 1908 (Privately printed). 88 pp. (p. 27).

oped a similar passion for human dissections. On one occasion, when a student at Louvain, he smuggled through the gates of the city at night the skeleton of a robber who had been executed on a gibbet; and when he had articulated the completed skeleton in his rooms, he dared demonstrate it to his friends. But these activities soon were discovered and he was in consequence forced to flee Louvain.

This courageous searching for the truth in an age of superstition and slavish adherence to the past made him a marked man, and it must partially account for the fact that when only twenty-two years of age he was appointed professor of anatomy at the University of Padua. But before going to Padua he had first studied at Paris, where his crusading spirit led him almost at once into conflict with authority. Quoting the tag from Emerson that "Universities are hostile to genius," Edward Streeter adds that Emerson might have cited the University of Paris and Vesalius to prove his point. "For here was a genius who had artiled with destiny to dedicate himself, his gifts, his splendid impatience to Reform; and here a University so encrusted and ankylosed with Conservatism that there was nothing quite like it in Europe at the time. What was Vesalius doing in that high, hushed Temple of Authority, that Depot of Bigotry, where studies in the schools had subserved the Faith for twelve generations and more? Did he hope at nineteen, by some open process, to supple the hard unintelligence that reigned in those schools, 'so great, so rich, so rigid' (as Rabelais describes them), where, if a scholar dares pronounce *quisquis* or *qualis* in other than the medieval manner he is like to be stripped of his dignities?"⁶

Vesalius had matriculated in medicine at Paris in 1533, and despite his brushes with the faculty he continued to work for the next three years, fulfilling the requirements for a doctoral degree. Had it not been for the threat of war between France and the Imperial forces of Charles V, to whom Vesalius and his family were closely tied, he would have taken his degree; but he returned to Louvain without it. His two masters, Jacobus Sylvius and Guenther von Andernach, were impatient with their doubting pupil, so much so that Sylvius, before Vesalius finally departed, became so enraged with him that he would probably have opposed the awarding of his degree. To quote

Streeter once again in reference to these years in Paris:⁶

The tough hearts of those who pioneer grow tougher under disappointments. Vesalius was galvanized into action. He plotted to end those traffickings with the seven types of lower animals which Galen allowed as substitutes, and to humanize the study-material at Trinquet. At the risk of his life he made forays to the gibbets of Montfaucon and the graves in the Cemetery of the Innocents.

"I acknowledge no authority save the witness of my own eyes," said this champion of the *visum et repertum* method. "I want liberty to compare the dicta of Galen (Prince of Physicians!) with the tangible facts of bodily structure." He labored constantly to improve the technique of dissection; he tells how he thrust aside the bungling barbitonsors who, he says, "had made a mess of the eight muscles of the abdomen which they exposed in torn and sadly confused order" and how he carried on, layer by layer, dissections of the muscles, vessels, nerves, bones. Such skill with the knife had not been seen before in the city on the Seine. He performed the "Public Anatomy" of that year (and the next) single-handed and alone, *solito absolutius*. It was the third he had ever seen.

Vesalius had returned to Louvain in July, 1536, and after spending a year there, during which he presented his translation of the IXth book of Rhazes as a thesis for his doctor's degree (February, 1537), we lose track of him for some three months. He is next heard of in Padua where in December, 1537, he had been made a professor of surgery, which involved the responsibility of giving a public dissection. This he did with consummate success, and according to contemporary accounts, students traveled from great distances to see his public demonstrations.

The Tabulae Sex

We now come face to face with what Charles Singer refers to as the crux of the Vesalian problem. In a newly published monograph, entitled *A Prelude to Modern Science*, Singer and Rabin offer a minute study of the circumstances surrounding the publication of Vesalius' initial work issued at Venice on April 1, 1538, scarcely four months after he had reached Padua. During the past four hundred years, the six anatomical tables have been studied by eminent anatomists and historians and many distinguished artists, and even to Singer and Rabin they remain to some extent enigmatic. To Singer, Vesalius "opens a new scene as with the quick rise of a curtain, for it is essentially and brilliantly modern—modern in

appearance, modern in outlook, modern in method, modern in its art and in its technique. And modern, too, in what it omits no less than what it includes. It is a startling apparition in the very midst of that imitative world of the revival of classical learning which still pervades its language. To appreciate at all the magnificence of the great adventure of the *Fabrica* we must know something of its starting point—the starting point being the six anatomical tables.”

The first three of the tables depict the portal circulation, the venous circulation, and the arterial, and together they represent an unoriginal résumé of Galenic anatomy. The heavy hand of tradition still lay upon the twenty-three-year-old Belgian anatomist. The vessels as delineated are inaccurate in many details, and they are more in line with the Galenic texts than with human anatomy as we now know it. Yet, as Singer eloquently points out, there had been nothing like them in technique of woodcut execution or in their attempt to provide medical students as well as anatomists with a visual image of the Galenic corpus.

It is probable that Vesalius himself drafted the original sketches on which the first three tables were based. Tables IV, V, and VI, on the other hand, were the work of Vesalius' colleague from the Low Countries, Jan van Calcar, and this is explicitly stated in the introductory comment to the first table: “I have sent these drawings themselves to the press,” Vesalius writes. “To them we have annexed others comprising three representations of my skeleton which I have set up to the gratification of the students, rendered from three standard aspects by the distinguished contemporary artist, John Stephen [van Calcar].” Singer adds that the skeleton in question had been put together in January, 1538, for a public dissection at Padua, and that it must have come from the body of a youth aged about eighteen as is evidenced by the state of the epiphyses and sutures.

In the preface of the *Tabulae*, Vesalius mentions that he had a larger work in mind, and elsewhere (*Venesection Epistle*, 1539) he mentions that if he continues to have the services of his friend, John Stephen, he will get on with the work; but in 1543, when the great muscle plates of the *Fabrica* were to see the light of day, no mention is made of Calcar nor of any other artist who may have been associated with the undertaking. Singer and Rabin, without discussing the

evidence pro and con, state categorically that it seems to them unlikely that any high proportion of the figures of the *Fabrica*, or the *Epitome* which also appeared in 1543, is by Calcar. As a working hypothesis they suggest that the artist of the *Fabrica* must have been “a young man, unknown to fame, who died before the book was printed.” They add further: “It does not seem that they [the three skeletons of the *Tabulae*] are by the same hand that drew the three magnificent skeletons of the *Fabrica*. The jaunty gait of the fifth and the stiff lecture-room stance of the fourth are in strong contrast to the noble poses of the *Fabrica* skeletons. Nor does it need much anatomical analysis to see that many elements in the *Tabulae* skeletons are out of drawing. These conclusions seem to rule out the artist of the *Tabulae* as the artist of the *Fabrica*. When the *Tabulae* were published, Calcar was 39, an age that cannot be called formative for a draughtsman. It is difficult to believe that one who could work no better in line could develop at 44 into the great creative artist of the *Fabrica*. For this reason, among others, we do not believe that Calcar made most of the drawings for the later work.”

The Singer-Rabin conclusions coincide with the general feeling of many scholars, but they are set forth in a dogmatic fashion and in the midst of a monograph heavily documented in other directions, but without the slightest indication of the basis of their sweeping deductions, beyond those actually stated in the quoted passages just given. Mr. William M. Ivins, Jr., formerly Curator of Prints at the Metropolitan Art Museum in New York City, has reached quite a different conclusion, namely, “that perhaps the more mature John Stephen, who paid the costs of printing and publishing the *Tabulae Sex*, was the real entrepreneur of the *Fabrica* and the *Epitome*, and that Vesalius' part . . . was merely that of a young medical man who was handy with his pen and who was engaged to write the commentary to accompany the drawings that John Stephen had made out of his long years of industrious investigation.”³

This observation is challenging, for if Calcar, unaided, executed the plates and merely employed Vesalius as a hack writer, then the wandering artist of the Low Countries, who had had no formal training either in medicine or in dissection, must be proclaimed the founder of modern anatomy and experimental medicine.

Since the beginning of printing with movable

type, it has been customary for authors who wished to illustrate their books to seek professional assistance of draughtsmen, artists, woodcutters, engravers, and, more recently, of photographers. Anyone who has published a highly illustrated book in which the figures are drawn by an artist under the direction of the author fully realizes his debt to the artist, and there are many instances in which the excellence of the illustrative matter has been in large measure responsible for any success that the book enjoyed. The late Dr. Howard Kelly's monograph on the appendix and his textbook of operative gynecology have become collectors' pieces because of Max Brödel's remarkable drawings; but one could not claim that Brödel was the real entrepreneur of this classic. Similarly, in the eighteenth century William Hunter issued a memorable folio on the *Gravid Uterus*. The text, in this instance, was brief, but five or six of the best artists and engravers of the time were employed for the illustrations, and Hunter also had the wit to choose Baskerville as his printer, even as Vesalius had chosen his friend Oporinus. The Hunter plates have been profoundly admired, but here again the anatomist, not the artists, must be given primary credit for the princely folio.

Acknowledgment of indebtedness is usually made by the author to the artist and the engraver, but less frequently to the draughtsman who has been employed to make a linecut or diagram. In the fifteenth and sixteenth centuries it was not customary for an artist or an engraver to sign his illustrations, any more than it was common practice in the fifteenth century for a book to have a title page. Consequently, many of the finest early examples of the woodcutters', and later of the engravers', art have come down to us without indication of who executed them. If one examined illustrated works contemporary with the *Fabrica*, one would often find no indication of artist or engraver. It would thus appear that we can dismiss any deliberate attempt on the part of Vesalius to withhold credit from those who had assisted him.

In the second place it seems clear that it was Vesalius who first conceived the plan of preparing a human anatomy, and that he must therefore be allowed credit, not only for the originality of the idea, but also for his persistence in seeing the plan through. When we come to the *Fabrica*, the evidence of Calcar's participation, as Singer has im-

plied, is less well established. Cushing, in a detailed discussion of Vesalius and Calcar in the introduction to his "Bio-bibliography,"¹ points out that in the *Venesection Epistle*, published somewhat over a year after the *Tabulae Sex*, Vesalius speaks in the preface of continuing his systematic studies and writes specifically: "We have now completed two plates of the nerves also: in the first the seven pairs of the brain are delineated; in the second the branches of the entire spinal cord are portrayed. I thought I ought to keep them till the time when I should undertake the plates of the muscles and all the inward parts. We have tried to make out a scheme of the dissections of this present year in the most convenient manner possible; but in view of the great crowd of spectators it proved altogether impossible to complete it."

There can be no doubt, however, that Calcar and his associates in Titian's studio did help materially with the drawings of the *Fabrica* as well as with those of the *Tabulae Sex*. The well-known collection of drawings originally belonging to Richard Mead, and transferred after his death to the Hunterian Museum at Glasgow, are almost certainly preliminary sketches made by Calcar for the *Fabrica*. That they were only preliminary is emphasized by Garrison² who draws attention to the fact that their outlines are obscure and much less accurate than those which eventually appeared in 1543. Indeed, they are precisely the type of preliminary sketch that any medical artist of the present day would submit to an author for correction and suggestion. The engraving of the bladder, for example, omits the openings of the ureters; these were subsequently introduced in the otherwise almost identical figure of the bladder which appeared in the *Fabrica*—an artist drawing such a lowly viscus could easily overlook these inconspicuous but physiologically important apertures.

But there is another and much more cogent reason for giving Vesalius primary credit, and that lies in the frontispiece of the *Fabrica* itself. Study of the preliminary *croquis* of the title page indicates that when the elaborate title was first drafted, and throughout the later stages of its development, there were two prominent figures, one, the central figure of Vesalius and the other the artist, notebook in hand, standing over Vesalius' shoulder sketching. The notebook, moreover, carries on its two covers the initials "S.C." [Steph-

en Calcar]. The earliest of the *croquis*, that at Stockholm, has the name "Jean Calkar 1675" written by a later hand. The Glasgow *croquis* was declared by Roth to be unquestionably the work of Calcar, and the important Crummer *croquis* is signed by the author in ink identical with that used for the drawing itself, i.e., "Joh. Stephanus, inv. 1540 Venetiis." The evidence that Calcar was responsible for the frontispiece is thus abundantly clear. If he had been the driving force responsible for the original dissections and Vesalius merely his convenient hack, would he have been so self-effacing as to place his ghost writer in the central position and himself in the background with his notebook? Since Calcar died two years after the appearance of the *Fabrica*, Vesalius, had he chosen to do so, could easily have blamed his artist for some of the errors that had to be corrected in the second edition. This he did not do in spite of the storm of abuse which the publication of his book had brought down on him.

One cannot leave the question of the authorship of the plates without considering Calcar's master. It has always seemed odd that Vesalius' contemporaries referred to the plates in the *Fabrica*, particularly those of the muscle men with the elaborate landscape in the background, as being the work of Titian, and that little claim was made for Calcar until the nineteenth century. May it not be that there is some basis for the earlier attribution? As just mentioned, it is well recognized that Calcar collaborated with Vesalius in the preparation of the *Tabulae Sex*, issued in 1538. But the extent to which Calcar or any other artist was involved in the larger undertaking of 1543 has nowhere been made clear and any claims for credit have always been based more on surmise than on documentary proof.

Quite recently, Dr. Erica Tietze-Conrat has disclosed an important contemporary reference to Titian's association with Vesalius, hidden away in the obscure *Diceria* of Annibale Caro.⁷ In discussing "La statua della Foia, ovvero di Santa Nafissa," he makes reference to "La notomia del Vecelli," which unquestionably refers to the *Fabrica* of Vesalius. Although there is some uncertainty about the date of Caro's *Diceria*, internal evidence suggests that the passage in question was written in 1539; a later passage suggests 1543. Either date would be possible since Vesalius' association with Titian's studio began in 1538 (or

possibly even in 1537), and the preface to his *Venesection Epistle* of 1539 indicates that in that year he was already planning the plates of the *Fabrica*. Caro spent several months in Venice in 1540, during which time he became intimate with Titian whom he met through his host, the poet Domenico Venier.

It is thus clear that Caro was in personal touch with Titian at the time the Vesalian plates were being designed, and the fact that so close a contemporary attributed them to Titian makes necessary a reconsideration of the part which Titian may have played along with his pupil Calcar in designing the plates. Miss Tietze-Conrat's conclusions seem highly relevant, and since her paper is published under a somewhat misleading title and would not ordinarily come to the attention of medical historians, it has seemed desirable to quote her argument in full:

Caro's attribution to Titian does not represent a later tradition based on quality and substituting, as is always the case, a greater name for a lesser whose memory has faded; here, as a matter of fact, is no tradition at all, but an almost contemporary piece of information. How does this compare with the more precise and thrice repeated report by Vasari [in which he claimed authorship for Calcar]? Since Caro's observation proves that the attribution to Titian goes back to the sixteenth century, Vasari's remarkable emphasis on Calcar may have been meant as an intentional correction of what he considered an error. My personal opinion, however, is that Vasari might have wanted to throw light on the share in the woodcuts of his usually underrated "amicissimo Calcar." As a matter of fact, had attention not been drawn to Vasari's testimony, nobody would have questioned the attribution to Titian, since the postures and the proportions of the figures, and the landscape in which the figures are placed, are entirely in his style. They are so to such an extent that we are tempted to imagine that Calcar, whose portraits are very close to Titian's, was likewise dependent on Titian in his other paintings, none of which are preserved. Caro's early attribution of the *Anatomy* to Titian might be interpreted as evidence of a special sort of division of labor. When Vesalius wanted the illustrations made, he may have got into touch with Titian's studio. The assistant chosen for the task was probably Calcar, who, using either large nudes by Titian or, more likely, studies of poses made by him, transformed them into clear outlines which under Vesalius's supervision he filled with anatomical details. The latter alternative seems more attractive, since we are unable to imagine how such large nudes by Titian, none of which exist, may have looked. Calcar made a similar use of Titian's landscape sketches. According to my hypothesis then, the artistic invention of the figures, the *idea*, in the terminology of the period, and the *mise en scène* would be Titian's, while Calcar's would be that of the "medical designer," "il che gli

doverà in tutti i tempi essere d'Honore." This would correspond exactly to the division of labor typical of Raphael's studio and such an amount of participation by a pupil would also be compatible with any reasonable conception of Titian's workshop. The painstaking rendering of the minute results of the anatomical studies would contradict any notion that Titian himself was the medical designer.

Dr. Tietze-Conrat's deductions appear fair and reasonable, and when considered in association with evidence from Vesalius' own writings, which have been fully set forth by Cushing in his *Bio-bibliography of Vesalius*,¹ one might permissibly reconstruct their relations as follows:

The young Vesalius appeared at Padua and Venice in the summer of 1537. In December he received not only his M.D. but an appointment to a specially created chair of surgery, in connection with which he was obliged to give public dissections. By January, 1538, or possibly earlier, he must have fallen in with artists in Titian's studio, for by April 1 they had between them designed and published the *Tabulae Sex*. Within a few months of the appearance of the six tables, they were planning the larger work, and if Miss Tietze-Conrat is correct, Titian was consulted and began to direct the planning of the figures.

But whatever their contentions concerning the authorship of the *Fabrica*, historians of medicine will heartily agree with Mr. Ivins⁴ on one point—that the reason why the *Fabrica* marked a turning point in the history both of medicine and art lies in the fact that for the first time a satisfactory synthesis had been reached between the work of the artist and the verbal descriptions of the physician-dissector. It was an achievement made possible by highly effective collaboration, and the imaginative direction of the undertaking came from Vesalius, rather than from his artist associates, however skillful and talented they may have been in assisting with the master plan.

A hospital would not think of failing to provide a patient with a routine urinalysis, and yet it is stated that only four-tenths of one per cent of cases of diabetes are discovered by such a routine procedure. The amount of significant tuberculosis discovered by providing a routine x-ray is much larger. It is also said that less than one per cent of patients provided a routine blood count have a blood dyscrasia. Less syphilis is found by providing routine Wassermanns than significant tuberculosis by providing a routine chest x-ray.—ALLEN FILEK, M.D., NTA Trans., 1947.

* * *

First tentative steps toward rehabilitation should be taken as soon as the patient's clinical status permits, and,

The impact of the young Vesalius on medicine has been felt for four centuries and more—and his life achievement will ever serve as a stimulus and inspiration to those who practice the art of medicine.

* * *

Since it is in libraries that we preserve the record of the contributions of such men as Vesalius, I should like in closing to express one additional thought about physicians and medical libraries.

There are more than 2,000 county medical societies included within the continental United States and the Territory of Hawaii. About 10 per cent, or some 200, have attempted to maintain medical libraries, and I think you will find that the societies which have the foresight to support their own library are the ones responsible for medical progress, for the one unmistakable hallmark of the intellectual vigor of any group lies in its library, and by it one can unfailingly judge the intellectual and scientific preëminence of the men who have founded and supported it. If a group has the urge to support an institution such as this, and to command personnel of the quality of Miss Mary Post and Mrs. Eleanor Olson, and of Miss Isabelle Anderson who has so recently left you after seventeen years of devoted service, it becomes automatically a great force for progress in the profession. On behalf of another medical library which is only seven years of age, I bring sincere congratulations to your older institution on its fiftieth birthday—and I must add that the Historical Library at Yale takes inspiration from your example.

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the period of hospitalization should be used to the fullest extent for purposeful activities directed toward the final aim of physical, psychic and economic rehabilitation.—MAX PINNER, M.D., Editorial, American Review of Tuberculosis, (Aug.) 1947.

Preventive medicine requires not only the co-operation, consent, and understanding of the individual who is to be benefited; oftentimes he must take the initiative—he must realize that it is just as important to seek advice from his physician on how to keep well as it is to call upon the physician for help when illness strikes.—Medicine in the Changing Order, Rep. N. Y. Acad. Med. Comm., Commonwealth Fund, 1947.

THE ASSASSINATION AND GUNSHOT WOUND OF PRESIDENT ABRAHAM LINCOLN

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THE terribly tragic war between the states started by the firing on Fort Sumter in April, 1861, and ended when the brilliant, gallant, and noble Lee met the modest, silent, and imperturbable Grant under the apple tree at Appomattox, April 9, 1865. A report at that time stated "The whole country was clad in the garments of joy and every face wore an expression of gladness. The bells from Maine to California and from the Lakes to the Gulf pealed forth tones of exultation as better and still better news arrived." Great was the happiness and relief of the war-worn, sad-faced President. A crowd gathered before the White House and called for the President. A band serenaded, and then Lincoln appeared. He spoke a few words to the assembly and asked the band to play "Dixie."

General Grant came on to Washington and was the great hero of the day. The Cabinet met with President Lincoln. The city of Washington was surcharged with tenseness, joy and exultation, and withal much work. On Good Friday evening, April 14, 1865, Laura Keane, the great actress, was to appear at the Ford Theater in Washington in the play "Our American Cousin," a broad comedy. Mrs. Lincoln was desirous that the President and herself attend the theater with General and Mrs. Grant as their guests, but at the last moment General Grant had to go to New York and so Major Rathbone and his fiancée, Miss Clara Harris, accompanied the President and Mrs. Lincoln to the theater and occupied the State box with them.

The presidential party entered the box about 9:00 p.m. President Lincoln sat in a rocking chair near a door leading into the box through which the assassin entered. He was shot about 10:30 p.m. by John Wilkes Booth, a brother of the great actor and tragedian, Edwin Booth, and a handsome young actor himself, of whom it was said, "So bright, so gay, so kind, no young man had brighter prospects in life." The clearest account of what happened in the Ford Theater on this tragic night of April 14, 1865, that has come to my observation, is given by Dr. C. S. Taft, As-

sistant Surgeon, U. S. A., under the title "Last Hours of Abraham Lincoln," which I quote in full:

The following brief report of the circumstances attending the assassination, last hours, and autopsy of the late President, will doubtless prove of much interest to the profession, and may be relied upon as correct in all particulars, the notes from which it is written having been submitted to comparison with others taken, and corrected by the highest authority.

While sitting in an orchestra chair at Ford's Theatre, on Friday evening, the 14th inst., about 10:30 p.m., I heard the sharp report of a pistol in the direction of the State box, and turning my head in that direction, saw a wild looking man jump from the box to the stage, heard him shout "*Sic semper tyrannis*" as he brandished a glittering knife in his right hand for an instant, and dart across the stage from sight.

A few moments of utterly indescribable confusion followed, amid which I heard a call for a surgeon. I leaped upon the stage, and was instantly lifted by a dozen pairs of hands up to the President's box, a distance of twelve feet from the stage.

When I entered the box, the President was lying upon the floor, surrounded by his wailing wife and several gentlemen who had entered from the dress-circle. The respiration was inaudible and scarcely perceptible, and he was totally insensible. Asst Surgeon Charles A. Leale, U.S.A., was in the box, and had caused the coat and vest to be cut off, in searching for the wound. The wound in the head was soon found, but at that time there was no oozing from it.

Several gentleman in the box were insisting upon having the President removed to his home, but Dr. Leale and myself protested against such a proceeding, and insisted upon his being carried to the nearest house. He was removed to a house opposite, and laid upon a bed in fifteen minutes from the time the shot was fired.

The wound was there examined, the finger being used as a probe, and the ball found to have passed beyond the reach of the finger into the brain. I put a teaspoonful of diluted brandy between the lips, which was swallowed with much difficulty; a half-teaspoonful, administered ten minutes afterward, was retained in the throat, without any effort being made to swallow it. The respiration now became labored; pulse 44, feeble, eyes entirely closed, the left pupil much contracted, the right widely dilated; total insensibility to light in both.

Surgeon-General Barnes and Robert K. Stone, M.D., the family physician, arrived and took charge of the case. At their suggestion, I administered a few drops of brandy to determine whether it could be swallowed, but as it was not, no further attempt was made. The

left upper eyelid was swollen and dark from effused blood; this was observed a few minutes after his removal from the theatre. About thirty minutes after he was placed upon the bed, discoloration from effusion began in the internal canthus of the right eye, which became rapidly discolored and swollen with great protrusion of the eye.

About 11:30 p.m., twitching of the facial muscles of the left side set in and continued some fifteen or twenty minutes, and the mouth was drawn slightly to the same side. Sinapisms over the entire anterior surface of the body were ordered, together with artificial heat to the extremities.

The wound began to ooze very soon after the patient was placed upon the bed, and continued to discharge blood and brain tissue until 5:30 a.m., when it ceased entirely; the head, in the meantime, being supported in such a position as to facilitate the discharge. The only surgical aid that could be rendered, consisted in maintaining the head in such a position as to facilitate the discharge of the wound, and in keeping the orifice free from coagulum.

Col. Crane, Surgeon, U.S.A., had charge of the head during a great part of the time, being relieved at intervals in this duty by myself. While the wound was discharging freely, the respiration was easy; but the moment the discharge was arrested for any cause, it became at once labored.

It was also remarkable to observe the great difference in the character of the pulse whenever the orifice of the wound was freed from coagulum, and discharged freely; thus relieving, in a measure, the compression. This fact will account for the fluctuations in the pulse, as given in the subjoined notes.

About 2 a.m. an ordinary silver probe was introduced into the wound by the Surgeon General. It met an obstruction about three inches from the external orifice, which was decided to be the plug of bone driven in from the skull and lodged in the track of the ball. The probe passed by this obstruction, but was too short to follow the track the whole length. A long Nelaton probe was then procured and passed into the track of the wound for a distance of two inches beyond the plug of bone, when the ball was distinctly felt; passing beyond this, the fragments of the orbital plate of the left orbit were felt. The ball made no mark upon the porcelain tip, and was afterwards found to be of exceedingly hard lead.

Some difference of opinion existed as to the exact position of the ball, but the autopsy confirmed the correctness of the diagnosis upon first exploration. No further attempt was made to explore the wound.

After the cessation of the bleeding from the wound, the respiration was stertorous up to the last breath, which was drawn at twenty-one minutes and fifty-five seconds past seven; the heart did not cease to beat until twenty-two minutes and ten seconds past seven. My hand was upon the heart, and my eye on the watch of the Surgeon-General, who was standing by my side, with his finger on the carotid.

The decubitus during the whole time was dorsal, and the position on the bed diagonal; the length of the bedstead not admitting of any other position.

The respiration during the last thirty minutes was characterized by occasional intermissions; no respiration being made for nearly a minute, but by a convulsive effort air would gain admission to the lungs, when regular, though stertorous, respiration would go on for some seconds, to be followed by another period of perfect repose.

At these times the death-like stillness and suspense were thrilling. The Cabinet ministers, and others surrounding the death-bed, watching, with suspended breath, the last feeble inspiration, and as the unbroken quiet would seem to prove that life had fled, turn their eyes to their watches; then as the struggling life within would force another fluttering respiration, heave deep sighs of relief, and fix their eyes once more upon the face of their dying chief.

The wonderful vitality exhibited by the late President, was one of the most interesting and remarkable circumstances connected with the case. It was the opinion of the surgeons in charge, that most patients would have died in two hours from the reception of such an injury, yet Mr. Lincoln lived from 10:30 p.m. until 7:22 a.m.

The following observations of the pulse and respiration were noted down by Dr. A. F. A. King, at the bed-side, and are correct. The pulse was counted by Acting Ass't Surgeon Ford.

10:55—48. 11:06—45. 11:18—42, and weaker. 11:24—42, respirations, 27 per minute, breathing quiet. 11:26—irregular, intermits occasionally. 11:30—45, resp. more frequent and vigorous. 11:32—45, stronger, resp. much more strong and stertorous. 11:37—48, resp. again silent and more feeble. 11:40—45. 11:43—45, resp. stertorous. 11:47—45, resp. 24, stertorous. 11:56—48, weaker. 12:10—48, irregularly intermittent. 12:18—48, same character. 12:27—54. 12:28—60. 12:29—66, intermittent. 12:38—66. 12:45—69, intermittent. 12:49—84, resp. 28. 12:56—66. 1:00—100. 1:15—92. 1:30—95. 2:10—60, resp. 34. 2:19—58. 2:32—54. 2:37—48. 2:54—48, much weaker, more thready, respirations feeble. 4:18—60, resp. 27, strong and stertorous. 5:40—64, thready, resp. 27. 6:10—60, hardly perceptible (Barnes), resp. 26, stertorous. 6:25—thready, not counted; resp. 22; inspirations jerking. 6:40—inspirations short and feeble; expirations prolonged and groaning; a deep, softly sonorous, cooing sound at the end of each expiration, audible to bystanders. 6:45—respiration uneasy, choking and grunting; lower jaw relaxed; mouth open; a minute without a breath; face getting dark. 6:59—breathes again a little more at intervals; another long pause. 7:00—still breathing at long pauses. 7:20—died.

About 1:00 a.m., spasmodic contractions of the muscles came on, causing pronation of the forearms; the pectoral muscles seemed to be fixed, the breath was held during the spasm, and a sudden and forcible expiration immediately succeeded it.

At about the same time both pupils became widely dilated, and remained so until death.

During the night Drs. Hall, May, Liebermann, and nearly all the leading men of the profession in the city, tendered their services.

Autopsy: Five Hours After Death

Present: Surgeon-General Barnes, Col. Crane, Dr. Stone, Ass't Surg. Woodward, U.S.A., Ass't Surg. Curtis, U.S.A., Ass't Surg. Notson, U.S.A., and Act'g Ass't Surg. Taft, U.S.A.

The calvaria was removed, the brain exposed, and sliced down to the track of the ball, which was plainly indicated by a line of coagulated blood, extending from the external wound in the occipital bone, obliquely across from the left to right through the brain to the anterior lobe of the cerebrum, immediately behind the right orbit. The surface of the right hemisphere was covered with coagulated blood. After removing the brain from the cranium, the ball dropped from its lodgment in the anterior lobe. A small piece of the ball evidently cut off in its passage through the occipital bone, was previously taken out of the track of the ball, about four inches from the external wound. The hole made through the occipital bone was as cleanly cut as if done with a punch.

The point of entrance was one inch to the left of the longitudinal sinus, and opening into the lateral sinus. The ball was flattened, convex on both sides, and evidently moulded by hand in a Derringer pistol mold, as indicated by the ridged surface left by the nippers in clipping off the neck.

The orbital plates of both orbits were the seats of comminuted fracture, the fragments being forced inward, and the dura-mater covering them remaining uninjured. The double fracture was decided to have been caused by contre coup. The plug of bone driven in from the occipital bone, was found in the track of the ball, about three inches from the external wound, proving the correctness of the opinion advanced by the Surgeon-General and Dr. Stone as to its nature, at the exploration of the wound before death.

The ball and fragments, together with the fragments of the orbital plates and plug from the occipital bone, were placed in the possession of Dr. Stone, the family physician, who marked and delivered them, pursuant to instructions, to the Secretary of State, who sealed them up with his private seal. The Nelaton probe used was also marked by me, and sealed up in like manner.

Present in the room at Lincoln's death were Mrs. Lincoln; their son, Robert Lincoln; many members of the Cabinet; the doctors, including Surgeon General Barnes and Dr. Taft of the Army, and Dr. Robert K. Stone, Lincoln's family physician; the Rev. Thomas Gurly; and generals of the Army. As Lincoln died, Stanton, the great Secretary of War, uttered these historic and prophetic words: "Now he belongs to the ages."

General Grant's train en route to New York was stopped at Philadelphia, and the General was notified of President Lincoln's assassination and ordered back to Washington.

Major Rathbone is said to have first noticed

the assassin of President Lincoln and grappled with him, but he was cut and slashed by a knife or dagger that Booth was carrying, and Booth escaped. Booth left the stage waving the dagger and shouting, "*Sic semper tyrannis*" (so be it always to tyrants) which appears on the seal of the State of Virginia.

Someone, comparing Lincoln to Duncan in Shakespeare's tragedy, quoted these lines, substituting the word Lincoln for Duncan: "Lincoln is in his grave; after life's fitful fever he sleeps well. Treason has done his worst, not steel nor poison, malice domestic or foreign, nothing can touch him further. This Lincoln hath done, his faculties so meek, hath been so clear in his great office that his virtues will plead, like angel's trumpet tongue against the deep damnation of his taking off."

A tragic fate awaited the five who entered the Presidential box that night. The President was assassinated, Mary Todd Lincoln, the President's wife, was ever after unhappy and became mentally ill. John Wilkes Booth, the assassin, in jumping from the President's box to the stage, caught his spur in the American flag which draped the box, and fell, fracturing a bone in his leg. Later he was shot to death by a soldier, Peter Corbett, while attempting to escape from a burning barn near Port Tobacco, Virginia. Miss Clara Harris who accompanied Major Rathbone to the theater was later murdered by him. Major Rathbone himself became a raving maniac.

In present times, President Lincoln would have been taken promptly to a modern hospital in an easy-riding modern ambulance over smooth pavement, but the doctors then felt it would be dangerous to move him in a horse-drawn vehicle over cobblestones, and so decided to carry him across the street to a small modest home, which they did, taking about fifteen minutes to get him into bed. In spite of modern means of transporting the injured, and the wonderful progress in brain surgery and medical treatment of brain injuries, I think it is the opinion of most surgeons who have studied the gunshot wound of President Lincoln, as shown by the recorded findings of the surgeons and the postmortem report of injury to the base of the brain and region of the pons, that the treatment today would be supportive and expectant observation. The subdural clots of blood might have been removed by surgery, but the

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RECURRENT DISLOCATIONS OF THE SHOULDER

Experiences with the Transplantation of the Subscapularis Tendon

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THE treatment of recurrent dislocations of the shoulder is a perplexing problem. There is a note of encouragement, however, if one carefully studies the evolution of the operative procedures which have been developed since the turn of the century. It has been estimated that somewhat over sixty operative procedures have been described for the correction of this malady. Every operation which has been devised is based upon the use of one or more of the following principles: (1) reconstruction,^{1,2,6,16,26} (2) supportive grafts,^{3,4,7,9,10,11,13,23,26} (3) tendon transplants,^{4,12,14,17,18,19,22,24,25,26} (4) muscle transplants.⁵ The author's choice for the correction of recurrent dislocations of the shoulder is based upon the principles described by Magnuson and Stack.¹⁸ Its merits will serve as the basis for this presentation. The operative technique, the postoperative management, and the reasons for choosing this procedure are set forth in the paragraphs to follow.

Operative Technique

The entire extremity and shoulder are surgically prepared in the usual manner. The former is covered with sterile stockinette and this is secured to the drapes so as to allow complete freedom of motion of the entire extremity without interfering with the remainder of the drapes. An anterior approach is utilized by making an incision 3.5 to 4 inches long, parallel to and over the bicipital groove. The delto-pectoral groove is identified to make certain of the location of the cephalic vein in order to avoid injuring it. The deltoid fibers are then separated by blunt dissection, starting at a point about 1 to 1.5 inches lateral to the delto-pectoral groove. The dissection is carried down to the rotator cuff. The subdeltoid fascia is retracted. Extreme care should be exercised to avoid injury to the circumflex branches of the axillary nerve which supply the anterior portion of the deltoid.

After the rotator cuff has been well exposed, the arm is rotated externally, and the inferior margin and also the width of the attachment of

the subscapularis tendon are identified. The bicipital groove is located, for this serves as a future landmark (Figs. 1, a and b). With the arm

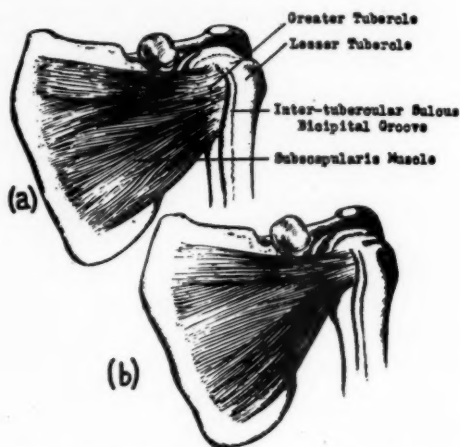


Fig. 1. Insertion of subscapularis tendon, (a) with wide attachment, (b) with narrow attachment. Identifying landmarks are also shown.

in external rotation, a small, slightly curved, periosteal elevator or a curved hemostat is introduced beneath the subscapularis tendon and directed upwards and parallel to the shaft of the humerus (Fig. 2a). The point of this instrument is brought out through an opening in the tendon or the rotator cuff (for narrow attachment). The tendon is incised down to the periosteum at the most distal part of its insertion (Fig. 2a). This incision starts at the level where the instrument protrudes through the opening in the tendon or rotator cuff and extends down as far as the inferior margin of the tendon. The insertion of the tendon, with its osseous attachments, is separated by means of a gouge. If the tendon is of an average width, approximately three-fourths is separated (Fig. 3). If it is quite narrow, the entire insertion should be detached (Fig. 2b). The detached portion is mobilized by cutting the fibers in the parallel axis for a distance of 1.5 to 2 inches (Fig. 3). At this point it is well to insert two traction sutures (Figs. 2b and 3) through the

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severed tendon in order to prevent retraction when the arm is internally rotated during the next step of the operation.

into the substance of the joint capsule along its antero-inferior margin. This suture is tagged and used later (Figs. 2b and 3). Two small drill

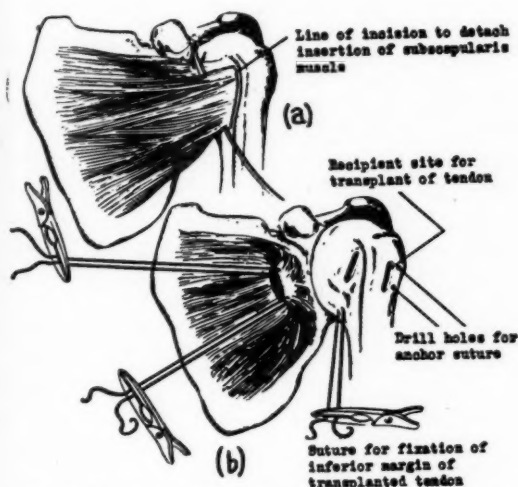


Fig. 2. (a) Elevator introduced beneath supscapularis tendon of average width. (b) with a narrow attachment, the entire insertion is detached.

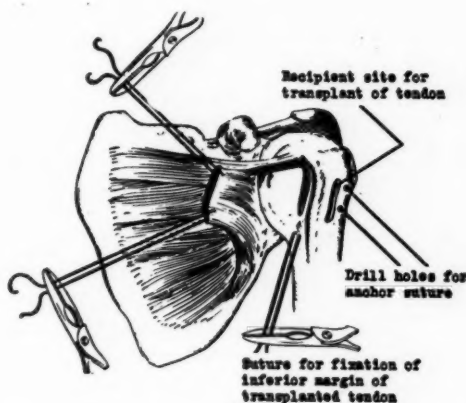


Fig. 3. With an average or wide attachment, about three-fourths of the tendon insertion is separated.

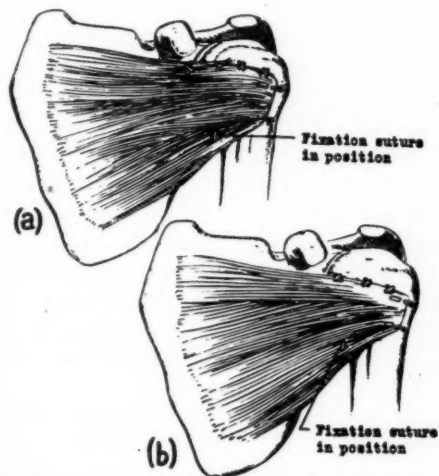


Fig. 4. Appearance of the transplant when completed, (a) with a wide tendon attachment, (b) with a narrow attachment.

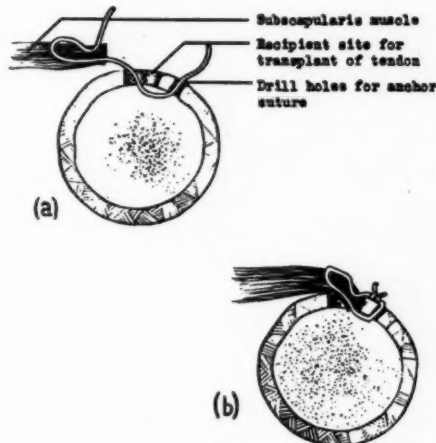


Fig. 5. (a) Placing of anchor suture. (b) Anchor suture completed.

In the next step, a portion of the cortex of the humerus is removed at a point lateral to the bicipital groove and at a level slightly lower and more distal than that of the original attachment (Figs. 2b and 3). This is the recipient site and should be about one centimeter more distal or lower on the shaft of the humerus than the donor site. At this time it is well to anchor one suture

holes are made through the cortex of the humerus, lateral to and communicating with the recipient site (Figs. 2b, 3 and 5a). Individual sutures of double strand chromic catgut are passed through each of the drill holes (Fig. 5a). These two sutures are used as anchor sutures for the tendon when it is transplanted. After the transplant has been completed, the upper edges of the cut ten-

don are firmly sutured to the rotator cuff by means of interrupted sutures of catgut (Fig. 4, a and b). The suture which was previously tagged is now brought through the substance of the inferior margin of the transplanted tendon and securely tied (Fig. 4, a and b). This serves to increase the sling effect of the transplanted tendon.¹⁸ The incision is closed in the usual manner. The extremity is immobilized by means of a sling, adequately secured to prevent abduction and external rotation.

Postoperative Management

The patient is allowed out of bed as soon as he has recovered from the effects of the anesthetic. The arm is kept immobilized in a sling adequately secured to prevent abduction and external rotation. This immobilization is continued for a period of four weeks. Following this, active motion, muscle development of the rotator cuff, especially the internal rotator group, and physiotherapy, in the form of heat and massage, is instituted. At the end of six to eight weeks most patients are able to abduct the arm to 90 degrees and have recovered approximately 75 per cent of their external rotation. *Forceful* abduction and external rotation are not encouraged beyond the point of discomfort until a period of four months has passed.

Preferential Reasons

1. This is a surgical approach which is not encumbered by vital structures.
2. No secondary incisions are necessary to obtain supportive grafts of bone, fascia, or tendon.
3. There are no complications or disability such as occasionally result at the donor site following the removal of fascia lata, bone, or tendon.
4. The operation is based on sound physiological and mechanical principles. The sling formed by the transplanted tendon makes an excellent support to maintain the head of the humerus in the glenoid and at the same time interferes very little, if at all, with the function of the subscapularis muscle.

Thirty-four patients were treated by this operative procedure. A complete and satisfactory follow-up is not available because many of them were operated upon at Guam. Of those who were carefully followed for periods ranging from fifteen to eighteen months, the results were excel-

lent. Several additional patients were heard from six months after surgery but these had not as yet regained a full range of motion.

Discussion

In view of the fact that primary dislocations often produce a traumatic functional disability of the subscapularis muscle²⁰ as well as stub fractures,²⁰ avulsion of the glenoid labrum,^{1,2,20} and a posttraumatic bursitis beneath the inferior margin of the rotator cuff,²⁰ it is not difficult to visualize why transplantation of the subscapularis tendon is effective in producing a cure in cases where the dislocation has become habitual.^{17,18} A simple capsulorrhaphy¹⁶ in the presence of a wide tendon, no doubt, will produce a fair percentage of good end results. Surgical trauma²⁰ of a sufficient degree to cause formation of adequate scar tissue which is capable of setting up a barrier for the gliding humeral head is in itself effective in a small number of cases. The operation in which a bone peg,^{3,7,23} is inserted into the antero-inferior margin of the glenoid is designed to work on the barrier principle. It is also conceivable that the Bankart operation^{1,2} and modifications⁶ thereof achieve some of the good end results from the same principle. The suspension operations^{4,5,9,10,11,12,14,19,22} are not based on this idea and therefore depend entirely upon the support given by the transferred tendon or fascia.

It is my opinion that dislocations which occur following any corrective operative procedure for recurrent dislocation of the shoulder can be largely attributed to improper postoperative management. I have had occasion to observe a number of such incidents, and in every instance the surgeon's enthusiasm failed to take into account the slow rate of nature's reparative processes. In every case, activity was forced or encouraged so that the patient would have a considerable range of motion at the end of three weeks following operation.

I believe it is imperative that adequate immobilization should be instituted and maintained throughout a period sufficiently long to allow nature's healing processes to achieve a desired maximum. This should be followed by physiotherapy designed to re-establish the muscle co-ordination of the rotator cuff. Special attention should be directed to rehabilitate the power of internal rotation. Power for this motion can be achieved by

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THE SURGICAL TREATMENT OF ANEURYSM OF THE ABDOMINAL AORTA

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THE following case of aneurysm of the abdominal aorta is reported because of (1) the long history before treatment was instituted, (2) the long survival after first operative treatment, and (3) the two different surgical approaches to treatment.

Comprehensive reviews of the subject of aneurysms of the abdominal aorta have been given by Matas, Bigger, Elkin, and DeTakats and Reynolds. Suffice it to say, that over 500 cases have been reported in the literature, of which thirty have had surgical treatment. From Bigger's statistics, about 80 per cent of patients suffering from abdominal aneurysms die in less than one year after onset of symptoms*. DeTakats, in a review of the literature, found instances of only six patients who survived operation for more than one year; to this series he added two cases of his own.

The operative treatment of aneurysm of the abdominal aorta consists of wiring, coagulation, the application of the Matas principle of endoaneurysmorrhaphy or ligation by means of fascia lata strips, metal bands, cotton tapes or cellophane. It is to be remembered that except for excision of the aneurysm any other treatment is palliative. To date there has not been a successful excision of a true aortic aneurysm, chiefly because of the failure of a collateral circulation to develop. This is in contradistinction to an arteriovenous fistula or coarctation of the aorta in which a good collateral circulation is usually present. Partial occlusion with metal bands or with silk or wire is usually unsuccessful because of the danger of rupture of the vessel at the point of ligation. Bands of fascia or tape frequently give way and allow the channel to reopen.

From the experimental work of Page and Pearce, the use of a cellophane wrap to produce a gradual fibrotic compression of the aorta was sug-

gested. In 1939, Page wrapped the kidneys of dogs in cellophane to produce hypertension. A marked tissue reaction was said to have occurred within three to five days following the application of "ordinary" cellophane. Within two weeks, a dense fibroblastic and collagenous deposit developed over the surface of the kidney, forming a constricting hull from 3 to 5 mm. in thickness. The hull continued to thicken for an undetermined period of time despite the disappearance of the cellophane. A foreign body reaction was said to have been produced by all of the varieties of cellophane used, although the moisture-proof types appeared less reliable than the others.

Harrison and Chandy wrapped cellophane proximally and distally to subclavian aneurysms in two Arabs. One of these was successful, the complete occlusion taking nineteen months. They suggested the use of this substance for the gradual occlusion in aneurysms of the aorta. DeTakats and Reynolds treated three cases of aneurysm of the abdominal aorta with eighty-ply cellophane; the patients were living up to fourteen months after operation.

Poppe and DeOliveira concluded from their experiments on dogs that Dupont 1.5 mil. polythene cellophane seemed to offer the most successful method of gradual fibrosis and obliteration of aneurysms and large vessels. The polythene cellophane which they used caused a pronounced fibrous reaction around the aorta in experimental animals. They used the same material on four humans, but without sufficiently long follow-up to report results. Osler Abbott has reported the use of polythene cellophane in the treatment of aneurysm of the thoracic aorta, its branches and of the pulmonary artery.

In direct contradistinction to the above work, other investigators consider cellophane as a physiologically inert substance. In 1936 Donati was the first to demonstrate this inert property of cellophane. Using regular commercial cellophane, 0.02 mm. in thickness to prevent adhesions between the brain and skull, he found the cellophane to be close to the brain after thirty-five days, with no irritative reaction surrounding it. McKeever studied the effect of cellophane (300 PUT and

*Presented before the Saint Paul Surgical Society, October 15, 1947.

*This statement applies more to syphilitic aneurysm than to those on an arteriosclerotic basis. Dr. John Lepak, of Saint Paul, informs me that one of his patients had an arteriosclerotic aneurysm of the abdominal aorta for thirty-five years, the walls of which later became calcified. Dr. C. N. Hensel, of St. Paul, has had a patient who survived at least twelve years after the diagnosis of arteriosclerotic aneurysm of the abdominal aneurysm was made. The fact that patients with arteriosclerotic aneurysm may survive a long time without treatment should be taken into consideration in advising surgical therapy.

71) in the treatment of arthritis, and found no reaction caused by the cellophane for at least two months after operation. Similarly, Wheeldon, using 300 moisture-proof cellophane as the lining of the joint in arthroplasty, found no irritation of the tissues. Ingraham, Alexander and Matson state that animal experimentation with the synthetic plastic material, polyethylene, in the form of flexible tubing and film has shown it to be well tolerated in animal tissues when used in pure form. There is no foreign body reaction, the tissue response being similar to that seen in the use of tantalum and methyl methacrylate. These authors insist that the polythene be pure, for in their experiments on cats, in replacing the dura with polythene, the impure material caused hematomata which were gradually absorbed and replaced by scar tissue. Brown, Grindlay, and Craig found that polythene was inert and could be used in the reconstruction of common ducts, the trachea, colon, et cetera.

In considering the above divergent views it is apparent that varieties of cellophane act differently in causing tissue reaction and that the same type of cellophane acts differently, depending on whether it is in a pure or impure state. It may be questioned how much tissue reaction is nonspecific foreign body reaction dependent upon surgical trauma, sutures, et cetera, rather than due to cellophane. Also, the time element may be important. Cellophane which may cause no tissue reaction in short-term experiments may cause fibrosis over a long period of time. These questions await further experimental study.

It should be mentioned that the cellophane in this country is manufactured by E. I. duPont de Nemours and Company, Incorporated, of Wilmington, Delaware. Polythene in bulk is furnished to manufacturers by this company. According to Mr. C. L. Blair, of the Technical Service of the duPont Company, plasticizer or any anti-oxidant material is not used in their make of polythene. There is incorporated in their polythene sheets less than 1 per cent of an ester-like material as an essential item in the manufacturing process. The nature of this ingredient is considered confidential to their process and cannot be revealed. Mr. Blair kindly furnished the polythene used in this reported case, which is the same type of material supplied to Dr. J. Karl Poppe.

The circumstances under which such occlusion of the abdominal aorta may be considered justifi-

able are as follows: (1) the patient should not be a poor risk, (2) there should not be extensive diffuse calcification of the aorta, and (3) the aneurysm should arise from the aorta distal to the renal arteries.

The following case is of interest because the patient had had a palpable aneurysm of the abdominal aorta for eight years before surgical treatment and he was living four years after a fascial taping proximal to the aneurysm. When he was operated upon again, a cellophane wrapping was applied to the proximal end of the aneurysm and another "patch" applied to the superior anterior surface of the aneurysm. The patient survived five months, when he died of a coronary occlusion. An autopsy was obtained.

Case Report

Mr. M. W., aged fifty-six, was admitted to St. Joseph's Hospital, Saint Paul, Minnesota, on April 20, 1947. He gave the following history:

In 1930 he was under the care of Dr. C. S. Raadquist at Hibbing, Minnesota, because of indefinite abdominal distress, which cleared up with diet. Also, he had pain in the back of the neck, which ran up into the occipital region.

In 1932 he was again seen by Dr. Raadquist and Dr. C. N. Harris of the Adams Clinic, because of a burning sensation starting in the pit of the stomach and radiating to the chest over the sternum. It was also present in both shoulders and down the arms to the hands. Eating aggravated the sensation and milk made it worse. He complained of much bloating, and when gas did form, the pain was worse.

In 1935 he had a similar attack, and at this time a diagnosis of coronary disease was made. At this time there was a small mass in the abdomen in the midline, which was pulsating. Gastrointestinal study showed diverticula of the colon. The mass in the abdomen was 4 by 5 cm. in diameter. A diagnosis of aneurysm of the abdominal aorta was made, which was confirmed by Dr. E. L. Tuohy of the Duluth Clinic. Blood pressure at that time was 106/70. An electrocardiogram showed a recent coronary occlusion involving the posterior descending branch of the right coronary artery.

In November, 1942, he had a check-up at the Duluth Clinic because of another coronary attack. The abdominal mass at that time measured 9 by 12 cm.

On May 20, 1943, the patient was seen at the Mayo Clinic where he was operated upon by Dr. J. de J. Pemberton for aneurysm of the lower abdominal aorta. According to Dr. Pemberton, at operation the aneurysm was about 10-12 cm. in size and was situated behind the mesentery of the small bowel. It began just at the terminal end of the aorta before it divided into the common iliac. A piece of fascia, 0.75 inch thick, was taken from the right thigh and wrapped around the aorta twice, producing partial constriction of the aorta just proximal to the aneurysm. Dr. Pemberton estimated that the proce-

ANEURYSM OF THE ABDOMINAL AORTA—REA

dures reduced the amount of blood through the aneurysm about 80 per cent. The patient left the Mayo Clinic June 9, 1943. The danger of rupture was explained and he was told to limit his activities.

In September, 1943, he was seen, at which time he had a pulsating mass 13 by 15 cm., the larger diameter being transverse. It showed 5 cm. above and 8 cm. below the umbilicus. Blood pressure was 112/68. He complained of epigastric distress, which was thought to be of coronary origin.

In October, 1944, he was again seen, when he complained of pain in the back. The mass in the abdomen was getting larger.

The patient was seen at the present admission in February, 1947. The patient complained of numbness and tingling of the toes. The mass in the abdomen also bothered him, and he wished something done, because he was "afraid that it might rupture." He was admitted to St. Joseph's Hospital April 4, 1947. Physical examination revealed a mass in the abdomen which measured 13 by 18 cm. It was situated below the umbilicus, was smooth, oblong, not tender to palpation. Blood pressure was 120/60. Examination of the blood and urine were essentially negative. Wassermann and Kline tests were negative. His heart showed left ventricular hypertrophy. The patient was operated upon on April 21, 1947, under cyclopropane anesthesia, through a right lower paramedian incision. The aneurysm was adherent to the anterior abdominal wall. The dissection was carried medially and the aneurysm was finally freed from the anterior abdominal wall. The retroperitoneal duodenum was lifted up and the root of the aorta visualized. There was no evidence at this time of the fascia lata strip. The aorta was atheromatous, especially on the anterior superior aspect of the aneurysm. Because of adhesions, the lower end of the aneurysm could not be definitely felt, but it certainly was down to the bifurcation of the aorta. A piece of polythene cellophane, 1 inch in width, was placed around the upper end of the aneurysm, and also another strip, about 2.5 by 3.5 inches, was placed over an atheromatous plaque on the anterior superior portion of the aneurysm. These were held in place by interrupted 0000 silk. The abdominal layers were closed with interrupted 000 silk. At the time of operation, a small piece of cellophane was placed subcutaneously, lateral to the incision in order to determine how much fibrosis might occur.†

The patient made an uneventful convalescence. He reported that the numbness and tingling of his toes had disappeared after operation and his feet felt warmer. It is a question whether the freeing of the aneurysm from the anterior abdominal wall had anything to do with it. The patient was discharged from the hospital on February 27, 1947. He was seen on June 11, 1947, at which time he felt well, the wound was well healed and the aneurysm measured 10 by 15 cm. Also, there seemed to be less pulsation in the aneurysm. The amount of fibrosis about the piece of cellophane placed subcutaneously and laterally to the incision was not remarkable at this time.

The patient wrote in July and August, 1947, that he

†Unfortunately, this area was not studied at autopsy.

felt well and was coming for a checkup, when, on September 16, 1947, he died suddenly from coronary occlusion. An autopsy was performed by Dr. G. Berdez, pathologist at St. Mary's Hospital, Duluth, Minnesota. The pertinent findings were as follows:

The heart weighed 530 grams. The cavities of the heart were markedly dilated, mainly the left ventricle, and there was an "aneurysm" of the lower half of the anterior wall of the left ventricle measuring 7 by 5 cm. and containing some mural thrombi. In that region the wall of the left ventricle was very much thinned out, formed by scar tissue, and measured down to .2 cm. in thickness. The cusps of the aortic valve were somewhat thickened and fibrous, and showed small areas of calcification. The other valves showed nothing of note. The foramen ovale was closed. The entrance to the coronary arteries was markedly narrowed. The coronary arteries showed arteriosclerotic changes, grade III, and were quite narrow. The anterior descending branch of the left coronary artery showed a marked calcification and was obliterated. The circumflex branch was almost obliterated and also showed some calcification. The right coronary artery was quite narrow. The aorta showed marked arteriosclerotic changes. There was a large aneurysm of the lower part of the abdominal aorta, just above the bifurcation. After filling this aneurysm with water, it measured 14 cm. in length, 10.5 cm. in width, and up to 8 cm. in thickness. Upon opening the aneurysm, the internal surface of the sac was somewhat irregular; large masses of thrombus material were attached to the internal surface. The wall of the sac (anterior wall) measured from .2 to .5 cm. in thickness and was quite fibrous; the wall was thickest in the upper anterior surface. The common iliac arteries, anterior to their bifurcation into the internal and external iliac arteries, showed also a marked and diffuse dilatation and measured up to 4 cm. in diameter; upon opening those vessels, there were masses of thrombus material which were still attached to their internal surface. The aorta showed marked arteriosclerotic changes which involved the arch of the aorta, the thoracic and the abdominal aorta; the changes were more marked in the lower part of the thoracic aorta and in the abdominal aorta. The intima showed numerous prominent yellowish patches, some of them breaking down; the edges of the defect were sometimes slightly undermined, and the degenerative changes extended to the media. The aneurysm of the lower abdominal aorta started about 1 cm. below the place where the renal arteries left the aorta; just above the renal arteries, the internal circumference of the aorta measured 5.5 cm. in length; the upper opening of the aneurysmal sac measured about 4.3 cm. in circumference. Between this upper opening of the aneurysmal sac and the place from where the renal arteries left the aorta, there was a segment measuring 1 cm. in length which was dilated also. Between that dilated segment and the upper opening of the sac, there was a ridge which was slightly prominent in the lumen of the aorta. At that place, the connective tissue surrounding the aorta was more fibrous. Rests of a cellophane band which had been placed around the neck of the aneurysm could not be recognized grossly.

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Anatomic diagnosis:

1. Coronary sclerosis, grade III
2. "Aneurysm" of the anterior wall of the left ventricle.
3. Arteriosclerosis, grade III, of the aorta with aneurysm of the abdominal aorta.
4. Congestion and emphysema of the lungs.

Comment

It is interesting that there was fibrous thickening at the upper end of the aortic aneurysm where the fascial strip and cellophane band had been placed. Also the wall of the sac seemed thickest in the upper anterior surface of the sac where the cellophane patch had been applied. No evidence of cellophane could be found on the aneurysm or in the peritoneal cavity at autopsy.

Because there had been a previous fascial taping at the neck of the aneurysm, it is impossible to say how much of the fibrosis was due to the fascial band and how much to the cellophane. However, it would seem logical to assume that the cellophane produced some fibrosis, at least on the anterior surface of the aneurysmal sac. For this reason, its use in the treatment of aneurysm would seem justified.

Summary

The case of an arteriosclerotic aneurysm of the abdominal aorta in a fifty-six-year-old male is

presented. The patient had a palpable aneurysm for eight years before surgical treatment. He lived four years after a fascial taping proximal to the aneurysm and five months after placing a cellophane band at the neck of the aneurysmal sac and a cellophane patch over the anterior surface of the sac. The patient died of a coronary occlusion. At autopsy there was evidence of fibrosis caused by the cellophane.

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THE ASSASSINATION AND GUNSHOT WOUND OF PRESIDENT ABRAHAM LINCOLN

(Continued from Page 149)

destruction at the base of the brain and the pons seemed too great for survival even with a successful operation for removal of blood clots. There can be no doubt that the wound was a fatal one and that modern scientific medicine and surgery could not have saved the great man and President.

Lincoln, perhaps more than any man of our nation, has become enshrined in the hearts of the people. When the Blue and the Gray met and shook hands at the Bloody Angle on Cemetery Ridge at the Gettysburg Battlefield fifty years after the Battle of Gettysburg, the Rev. Dwight Hillis who addressed them, speaking of Lincoln, said,

"When God wanted a father for his bondmen, He went to the poor man's log cabin in Kentucky, and taking his babe in his arms, called the best loved angel of heaven and of earth, the angel of mercy, and said—take this child, plant his pathway thick with thorns, cut his feet on the jagged rocks of time, take from him everything that he loves, break his heart a thousand times, and when you have done, bring him to the throne, and I will make him *great*. Thus did the great God make Abraham Lincoln the greatest man of the Republic."

RETINITIS PIGMENTOSA

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RETINITIS pigmentosa is a primary pigmentary degeneration of the retina. It is chronic in character. There is a slow progression of degeneration with a gradual loss of vision terminating in blindness.

There are two characteristic symptoms of the disease: (1) night blindness, (2) a gradual diminution in the size of the visual field. Early in childhood these patients complain of nyctalopia (night blindness). This is usually the first indication of a visual defect. With advancing years, there is a loss of the peripheral visual field until the patient has only central vision. Both of these conditions greatly handicap the individual. Other similar abiotrophic anomalies of the retina are choroideremia and gyrate atrophy. In this class of diseases the macula area is the last part of the retina to be destroyed. Some other hereditary retinal diseases are characterized by an involvement of the macula area very early in the disease, such as the Laurence-Moon-Biedl syndrome.

A great deal of work has been done on the hereditary aspect of retinitis pigmentosa and other abiotrophic diseases. Regardless of the diversity of opinion concerning the type of heredity, there is undoubtedly a strong hereditary tendency for these conditions to occur in families. In many studies at least one-half of the cases show a hereditary transmission. If an older child develops night blindness, other children surely are in danger of inheriting the same condition. A mother with primary degeneration of the retina may transmit the disease to her children.

There are three types of hereditary retinitis pigmentosa. First is the dominant hereditary type. This type is rare. In this type, the disease is transmitted through the female and affects the sexes equally. The affected patients inherit the disease from one parent and pass it on to half of the children. Usually retinitis pigmentosa develops late in life, between twenty-five and fifty years of age in the dominant type of heredity.

Second is the recessive type of inheritance. Most cases are of this type. The recessive trait is

most often found in consanguinous marriages. The disease is more severe and appears earlier than in the other types of inheritance. The number of carriers in this type is twice the number of those developing symptoms of the disease. The avoidance of intermarriage is imperative. The children of a father with retinitis pigmentosa will all be carriers.

The third type is a sex-linked heredity, and this type is rare. In the sex-linked heredity, half of the sisters of a male with retinitis pigmentosa and all of the daughters will pass the trait to half of their male children.

The clinical fundus picture of retinitis pigmentosa is characterized by a decrease in the size of the retinal vessels and peculiar pigmentary formation. Following the degeneration of the retina, pigment migrates in clusters, usually around the retinal vessels, resembling bone corpuscles. The pigmentary epithelium of the retina is decolorized. The choroidal vessels are visible and the fundus becomes tessellated. At first, the spots are smaller and are seen mostly in the periphery of the retina. Gradually, the pigment corpuscles increase in size and number, and more and more of these appear towards the macula area. The retinal arteries are greatly reduced in size until the arteries are mere threadlike bands. A peculiar pale wax color is seen over the optic disk. This is due to a formation of glial tissue and not to atrophy of the nerve fibers.

Many patients with retinitis pigmentosa are highly myopic. Many other defects may be found in addition to the retinal degeneration, such as deafness, mutism, and oftentimes nystagmus. In the later stages, posterior polar cataracts develop due to the malnutrition of the retina. The essential pathologic process seems to be a progressive degeneration of the neural epithelium with an early destruction of the rods. The destruction of the rods results in the early symptom of night blindness. There is general destruction of the neural epithelium with the formation of glial tissue.

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THE PRESENT STATUS OF THE RELATION OF CHOLESTEROL TO ARTERIOSCLEROSIS

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THE purpose of this paper will be to show in a general way the state of our knowledge as it relates to cholesterol metabolism and the development of atherosclerosis. It is hoped also that it will be possible to point out some of the deficiencies in our present knowledge of this important subject.

For several years it has been recognized that cholesterol is present in the atheromatous plaques of atherosclerosis. There has been no agreement as to the mechanism of entry of cholesterol into the intima of the arteries. The two most recent theories as to the mechanisms are those of Hueper⁸ and Leary.⁹ Hueper has suggested that the cholesterol enters into the subintimal tissues by simple imbibition as a result of a disturbance of the plasmatic colloidal equilibrium which holds it in solution. According to this theory, the cholesterol appears first as an extracellular material, which as an irritant produces fibrosis. The cholesterol is later taken up by phagocytic cells to form the so-called lipophages.

Leary has suggested, on the other hand, and has marshalled considerable evidence from experimental animals in support of his theory, that the cholesterol is esterified in the parenchymal cells of the liver. He postulates that under conditions of overload the hepatic cells become unable to metabolize the material, presumably are damaged, and are phagocytosed by the Kupffer cells. The Kupffer cells, now lipophages, enter the blood sinuses of the liver, are carried through the lungs, and finally enter the systemic circulation.

Even if one adopts Leary's theory, at this point a question arises for which there is as yet no answer. Why do these phagocytic cells with their load of cholesterol show a predilection for certain blood vessels? Leary has attempted to answer this question by saying that young fibroblasts in young vessels are able to metabolize the cholesterol and clear it from the blood vessel walls, and, further, that certain blood vessels, those commonly the site

of atherosclerosis, lose this fibroblastic metabolic activity in adult life.

This fibroblastic reaction may well be the mechanism of metabolizing the cholesterol deposited in the blood vessels during youth, but it does not indicate why one blood vessel will react in a way entirely different from another blood vessel of similar size and similar histological structure, nor why the blood vessels of one person will become sclerotic while those of another person will not.

It can only be concluded at this time that the pathogenesis of atherosclerosis is not yet understood.

While a great deal is yet unknown concerning the intermediary metabolism of cholesterol, certain basic facts are now well established. Cholesterol is an unsaturated monohydric alcohol, $C_{27}H_{46}OH$, which forms a series of esters with the common fatty acids. The substance is present in practically all mammalian cells. Numerous investigations have been undertaken to establish some viscous as the chief site of formation of cholesterol; however, the present thought is that the material is formed in the cells in which it is found or that it is ingested preformed. Cholesterol is closely related chemically to many of the plant sterols; yet it has been shown by Schoenheimer¹⁰ that these plant sterols are not absorbed by the human. Cholesterol is excreted largely in the feces in the form of its reduction products, coprosterol and dihydrocholesterol. As early as 1920 Gamble and Blackfan³ showed that the human infant excreted coprosterol in excess of its intake of cholesterol. This was taken to indicate that the human infant was capable of synthesizing cholesterol. More recent studies using tagged carbon have confirmed this early conclusion.

Numerous studies on the levels of cholesterol in the blood, in both health and disease, have been carried out. Reports have been at variance as to the blood levels in atherosclerosis. This discrepancy might in part be accounted for by the fact that the cholesterol levels found in whole blood, serum, and plasma differ significantly. It, therefore, becomes necessary to make all analyses on the same material. Whole blood gives the lowest

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values, oxalated or citrated plasma next, and serum the highest values. Heparinized plasma gives values comparable to serum which may be as much as 15 to 20 per cent higher than those obtained using citrated or oxalated plasma. This has been explained by Gardner, Gainsborough, and Murray⁴ as the result of the shrinkage of the red blood cells due to the oxalate and citrate with a resultant dilution of the plasma cholesterol. We have found that oxalating the serum after separation from the cellular elements of the blood does not change the cholesterol content as determined by the method of Sperry and Schoenheimer.¹¹ The reduction is not apparently a direct action of the oxalate on the cholesterol. The difference in values obtained on serum and plasma are greater than one would expect from the amount of dilution encountered from ordinary oxalate, which is usually about 6 to 8 per cent. It does not seem then that one can accept without reservations the dilution theory as the entire explanation of the differences found in plasma and serum values. Discrepancies should be viewed in the light of the methods used and the materials analyzed.

More recently, probably as the result of improved analytical methods, more investigators are reporting what they regard as significantly elevated serum cholesterol levels in patients with proven atherosclerosis. Among these are Davis, Stern and Lesnick,¹ Steiner and Domanski,¹² and more recently Herrmann.⁵

The very nature of atherosclerosis, with the difficulties of early diagnosis, makes the accumulation of data difficult except late in the disease. Thus rarely can one know for sure what was going on during the period of the formation of the atheromata. It is conceivable, as suggested by Leary,^{7,8} that the end result of atherosclerosis represents repeated episodes of hypercholesterolemia over a period of years with perhaps relatively normal values in the intervals. Attention has been called by Huepper⁶ to the fact that once free cholesterol is deposited in the intima of the blood vessels it is in a relatively inert form and would be expected to remain either permanently, or for a long period of time.

In support of this concept of repeated intermittent accretions during periods of hypercholesterolemia is the previously cited work of Steiner and Domanski.¹² They found that, whereas the serum cholesterol levels in their normal controls were relatively constant over the two-year period

of observation, the values in individual patients with coronary arteriosclerosis fluctuated widely during the period of study.

It is hardly necessary to call attention to the incidence of atherosclerosis in such conditions as diabetes and hyperthyroidism—conditions which are associated with hypercholesterolemia.

Faber² has recently published the results of analyses of the aorta in normal persons and in patients with coronary occlusion. He has correlated these with serum cholesterol levels in the same individuals. In the control group he found an increasing amount of cholesterol in the aorta with increasing age, which was not related to any increase in the serum levels. On the other hand, in the patients with coronary occlusion he found a number of younger individuals with an increase in the cholesterol content of the aorta well above that of a much older group. In this group with increased cholesterol content of the aorta there was an associated hypercholesterolemia in the nonhypertensive individuals, yet not in those with hypertension. It would seem then that two factors might be operative: one a metabolic factor which results in hypercholesterolemia and produces atherosclerosis, the other a tissue factor dependent on injury to the vessel, as for example from hypertension, with an increased tendency toward the deposition of cholesterol even in the absence of hypercholesterolemia.

It would seem, therefore, that evidence is accumulating which is suggestive, at least, that certain individuals possess an inherently defective mechanism for metabolizing cholesterol. These individuals may resemble the rabbit, a species which develops atherosclerosis quite uniformly if fed cholesterol. Conversely, other individuals may be more similar in this respect to the rat, in which cholesterol feeding does not produce atherosclerosis.

Studies have been undertaken to evaluate the response of various individuals, both normal and atherosclerotic, to varying loads of ingested cholesterol. It is too early yet to report on the results of these studies.

The discovery of certain lipotropic substances which will mobilize lipids from the liver, has suggested to us that these same substances might be effective in mobilizing cholesterol from atherosclerotic arteries, or, what is more likely, they might be effective in preventing the deposition of the lipid in the vessels of those individuals who are

predisposed to hypercholesterolemia. We are not yet in the position to report upon our experiments along this line, but Herrmann⁵ has recently reported upon the effects of decholesterizing agents, among which are some of these lipotropic substances. He has found what he regards as a significant effect from substances like choline, methionine, and inositol. More work is necessary along this line before any definite conclusions can be drawn.

Conclusions

1. Cholesterol would seem to be related etiologically to the development of atherosclerosis. The exact mechanism is not yet established.

2. It is suggested that certain individuals have an inherent defect in cholesterol metabolism which results in fluctuations in their serum cholesterol levels, probably related to dietary intake. It would seem that these individuals should be protected from overload by ingesting a diet low in cholesterol.

3. There is suggestive evidence that certain of the lipotropic substances may be effective in reducing the serum cholesterol levels in certain individuals with atherosclerosis; however, further work is necessary on this subject.

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RECURRENT DISLOCATIONS OF THE SHOULDER

(Continued from Page 152)

a well-developed subscapularis muscle, and it is my belief that a well-functioning subscapularis muscle is the best insurance against recurrence of a habitual dislocation of the shoulder.

Summary

1. The basic principles for correction of recurrent dislocations of the shoulder are enumerated.

2. The operative technique utilizing the principle of a tendon transplant is described.

3. A plan for postoperative management is outlined. Emphasis is placed upon a period of adequate immobilization followed by a well-guided program of muscle rehabilitation.

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THE FERGUS FALLS CANCER DETECTION CLINIC

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The first Cancer Detection Clinic conducted by a Medical Society in Minnesota was held in Fergus Falls on December 13, 1947. It is the purpose of this paper to set forth the rules and regulations, the organization and the results of this experiment.

Rules and Regulations

Each rule of conduct was separately voted upon by the Park Region and District County Medical Society at a previous meeting. Those of basic importance concern the examinee, fee, examining physicians, extent of the examination, reports, follow-up time, place, lay aids, promotion, registration, and the responsible committee.

It was decided to invite all apparently healthy adults regardless of financial status without reference and any others especially sent to the Clinic by their physicians with a letter of introduction. There was to be no fee. All participants conducting the Clinic, both professional and lay, were to be on a voluntary nonpay basis. Primarily, because of the prospects of a greater local success, representatives of the specialties, dermatology, surgery, gynecology, internal medicine, and otolaryngology were to be invited in to be in charge of their particular sections of the examination. The expenses of the out-of-town specialists were to be paid up to \$35.00 if requested. The local physicians were to assist in any part of the physical examination best suited to themselves. It was decided to hold the Clinic on a Saturday so that more of the local physicians could participate and a grade school could be taken over for the entire day.

A history and physical examination form prepared for cancer detection examination by the Kansas State Medical Society was adopted. This form permits a checking of symptoms by systems in the past history of the examinees by nurses. The physical findings have an anatomical arrangement which facilitates the recording of special fields of examination by the specialists. In addition, there is a summary of findings and recommendations at the end of the folded four (4) page record. Routine visualization of the cervix and rectal examination were considered essential. However, proctoscopic and laryngoscopic examinations were to be carried out only at the discrimination of the examiner. Biopsies, x-ray examinations and therapy were specifically excluded. No comment concerning the findings or recommendations were to be made to the examinee except that they were to call their family physician.

All completed reports were to be sent to the examinee's local physician. The examinees were to be sent a postal card reminding them to call their family physician concerning the results. A statistical review of the records were to be made by the Committee on Cancer of the State Medical Society.

This group was also asked to follow up case studies through the family physicians involved and summarize the entire experience.

From the Department of Pathology, St. Luke's Hospital, Duluth, Minnesota.

The local nurses' organization, the Red Cross and their nurses' aides were to be depended upon for a great contribution of time and effort. Other local organizations including the American Legion and the American Cancer Society consented to help. The latter organization was asked to pay the expenses of the imported specialists and other incidental expenditures. The Red Cross organization served coffee and doughnuts throughout the day to all assistants.

Two large advertisements announcing the time, place, sponsorship, limitations to healthy adults, place of registration, et cetera, were to be published in the local newspaper. Pertinent news items using local names were to be published and the radio station was to contribute spot announcements of the clinic.

All examinees were to register by phone at the local Red Cross office or with their family physician at least one week preceding the clinic. The examinee's name and family physician were recorded and appointments were given the registrants. It was left up to the local committee of three physicians to carry out the rules set down by the society and decide any of the details which might arise.

Clinic Organization

One week before the established date of the clinic 400 examinees were registered. Tactics developed in the late war for physical examinations of large numbers of men and women were adopted. Two series of examination rooms were set up to accommodate the two sexes (see accompanying sketch).

All examinees were checked at the entrance to the large gymnasium to establish their appointment. They then entered orderly lines to receive their case record from six lay typists who filled in the name, address, phone number, nearest relative, and name of the family physician.

In Room 1 the positive findings in their past histories were checked by six nurses.

From here all examinees visited Room 2 for ear, eye, nose and throat examinations, carrying their record sheets with them. Laryngoscopic examinations were performed only when indicated. Three specialists aided by two recorders were necessary.

The examinees undressed in separate rooms (3 and 4) and the women were supplied with a loose dress or dressing gown and shoes, and the men with pants and shoes. Weights, blood pressures, and temperatures were recorded here by male and female assistants.

The women proceeded to the gynecology room (5) where five examining tables were lined up facing one wall with tables, pans of cresylone, towels, speculae, flash lights, et cetera. Four physicians, four nurses and three recorders were necessary. The breasts, abdomen, cervical and rectal examinations were performed and results and recommendations recorded. In Room 6 the skin and mouth were examined by the dermatologist

FERGUS FALLS CANCER DETECTION CLINIC—BURNAP ET AL

SKETCH OF ARRANGEMENT OF EXAMINING ROOMS IN THE SCHOOL

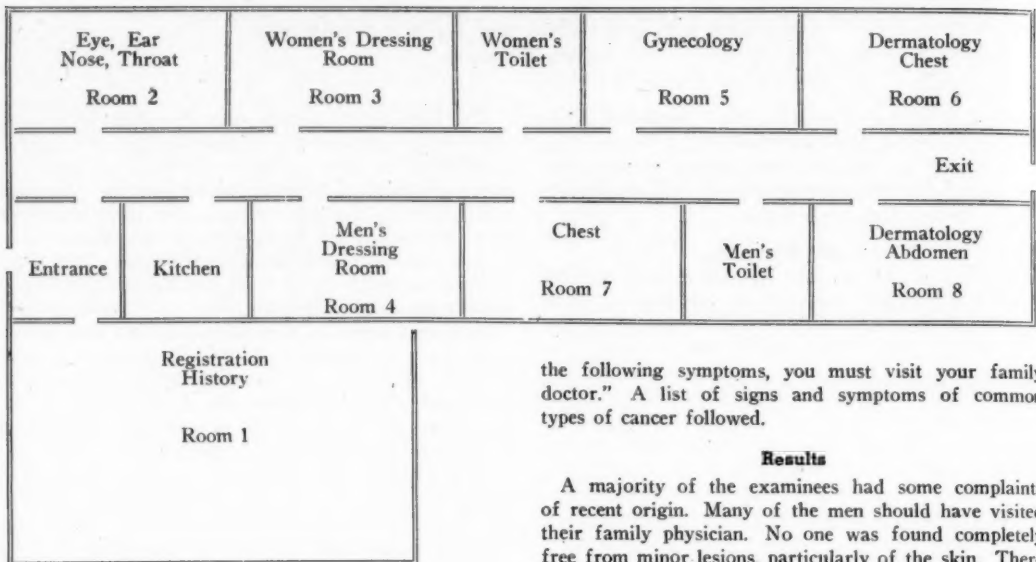


TABLE I. FREQUENCY OF SELECTED SUBJECTS IN THE PHYSICAL EXAMINATION, PAST HISTORY AND RECOMMENDATIONS

Physical Findings	Women	Men
Cervical ulcer, erosion, etc.	90-47%
Breast tumors	5-3
Moles	137-71	49-55%
Keratosis	40-20	11-12
Hemorrhoids	47-24	7-8
Murmurs	12-6	2-2
Hypertension	39-20	14-16
Prostatic hypertrophy	13-15
Other tumors	24-12	21-24
Other organic diseases	28-14	10-11
Some Items in Past History		
Headaches	63-33	21-24
Dizziness	53-27	22-24
Ringings in ears	30-15	4-5
Constipation	62-32	26-30
Other G.I. complaints	88-45	41-47
Evidence of peptic ulcer	8-9
Dyspnea	26-13	2-2
Recommended Diagnosis and Treatment		
Biopsy or cautery cervix	54-27
Dilatation and curettage of uterus	43-20
Skin biopsy and treatment	15-8	3-3
Skin surgery	46-24	5-6
Other biopsies	9-5	3-3
G.I. tract x-ray	16-8	18-20
Barium enema	7-4	11-12
Other laboratory procedures	10-8	22-24

and two physicians performed chest examinations on five examining tables. Three nurses and two recorders were used.

On the men's side there were two additional stops. In Room 7 chests were examined with the patient standing. In Room 8 abdominal, rectal and skin examinations were completed by three physicians with the aid of three nurses and two recorders.

After the examinations, all the examinees were given a card stating, "No examination will completely rule out the presence of hidden cancer. If you develop any of

the following symptoms, you must visit your family doctor." A list of signs and symptoms of common types of cancer followed.

Results

A majority of the examinees had some complaints of recent origin. Many of the men should have visited their family physician. No one was found completely free from minor lesions, particularly of the skin. There were 191 women and 88 men examined between 9:00 a.m. and 6:00 p.m. Of the women, 125 (65 per cent) and of the men 64 (72 per cent) required treatment or further diagnostic study by their family physician. Selected subjects from the past histories, physical examinations and recommended procedures of diagnosis and treatment are best reviewed in table form (Table I). Scientific programs emphasizing early detection of cancer were presented to the local medical society and the laymen at separate meetings in the evening. Both were well received and proved to be an appropriate climax of the day.

Conclusions

Most of the physicians taking part in the examinations felt that they had experienced a momentous day, that the experiment was well worth the effort and that similar clinics could profitably be organized in other parts of the state. The local physicians were pleased with the results. A closer relationship between the laymen and physicians of Fergus Falls unquestionably exists as a result of the understanding co-operation in the clinic. The term "apparently healthy" adult does not define the patients attending this cancer detection clinic. The majority of the examinees had complaints of recent date, many had a history of cancer in the family and there was an unusually high percentage of disease processes found. To eliminate those with active symptoms from a clinic intended for "apparently healthy" adults some barrier must be set up at the time of registration. Disregarding the educational value of the clinic to both physicians and laymen and the services rendered to 279 people in Fergus Falls, we feel this experiment will reflect itself in cancer research. This will result in part through a stimulus to the many people throughout the state who are anxious for the physicians to show a more co-operative spirit in the present widespread movement to control cancer.

Case Report

TOXIC NEURORETINITIS

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Mrs. J. C., a married woman, aged twenty-three, was referred by her family physician, Dr. H. Fisketti, on March 26, 1947, complaining of severe frontal headaches, shooting pains in the eyes and sudden loss of vision. The headaches and ocular pain had begun on April 23 after attending a theatre. She didn't care to eat and had one emesis that evening. On the following evening her vision had blurred until she was unable to read newsprint. She stated that she at first noted several blind areas which gradually fused together until the whole visual field was obscured. She had admitted "having a drink" on the night prior to onset of symptoms and wondered if this could have any relation to her blindness. She denied any contact with chemicals, dyes or varnishes and had taken no drugs.

Her past history was essentially irrelevant. She had diphtheria as a child of four with no sequelae. Four months prior to her present illness she had given birth to a normal child. She had excellent obstetrical care including both prenatal and postnatal observation. There was no indication of toxemia. There was a slight "hydronephrosis of pregnancy" one week before delivery which responded to bed rest. Her postpartum blood pressure was 124/78. Her pulse, respiration and heart rhythm were recorded as normal. She was discharged from the hospital on the fifth postpartum day. One week before her present illness, she had a slight attack of pharyngitis which cleared up in a day or two. She had worn glasses for three years for a moderate hyperopic error. Her corrected vision had always been excellent.

On examination, vision with correction was reduced to counting fingers at 8 inches in the right eye and 20/200 plus 1 in the left eye and could not be improved. There was tenderness on pressure on the globes. The pupils were in mid-dilatation and reacted rather sluggishly to light. The extra-ocular movements were normal. The media were clear throughout. Both retinas showed a half dozen or so soft, fluffy, pale grayish patches of edema about 1/4 dd in size around each macular area. The nasal margins of the discs were partially obscured. The veins were a little over full. The visual fields were normal in outline and no central scotomata could be found, but there were several relative paracentral scotomata in either field. A diagnosis of toxic retinitis or neuroretinitis, of unknown origin, was made, and the patient was hospitalized on the following day where complete diagnostic study was made.

General physical examination, apart from the eyes, was negative except for marked sinus arrhythmia and a moderate exaggeration of the deep reflexes. The patient suffered excruciating headaches and orbital pain the first day in the hospital, complained of vertigo, and vomited once. Sodium salicylate and sodium bicarbonate were administered by mouth. Penicillin was given intramuscularly to combat any possible infectious agent. The headache and orbital pain were gone on the second hospital day but the globes were still tender. The pupils were widely dilated and failed to react to light or convergence. Vision was further reduced to bare hand movements in either eye. The patches of retinal edema

coalesced until the whole macular and paramacular regions were diffusely edematous. The foveae were obscured. The discs became slightly hyperemic and the margins more blurred but were never appreciably elevated. On March 30 the patient complained of impaired hearing in the right ear. With it, she could hear a watch only at contact as compared to at 8 inches with the left ear. A neurological examination by Dr. L. R. Gowan on March 29 had been entirely negative except for the second and eighth cranial nerves. On April 2 the retinal edema began to recede and a faint greenish pigment tinge appeared in the paramacular regions. From this time on vision was rapidly recovered, and on April 9, the date of her discharge from the hospital, she could read one-eighth-inch type. The retinal edema was largely cleared, but several clumps of pigment were appearing in the paramacular areas, generally corresponding to the original patches of edema. The deafness increased.

X-ray examinations of the skull, paranasal sinuses and chest were negative. An electrocardiogram only confirmed the marked sinus arrhythmia noted clinically. Repeated urinalyses were negative. The white blood count reached 9,300 on one occasion. Red blood count was 4,390,000 and hemoglobin 13.5 gms. (95 per cent). Differential blood count was normal. Sedimentation rate was normal. Blood sugar was 93.0 mg., urea nitrogen 19 mg., and creatinine 1.5 mg. per 100 c.c. The Kline blood test was negative. Spinal fluid pressure, cell count, proteins and sugar were normal and the Wassermann negative. The blood serum failed to agglutinate *B. melitensis* or *B. tularensis*, and agglutinated *B. typhosis* and *B. paratyphosis* only in 1:80 dilutions. Blood pressure was normal and temperature was normal throughout. On the basis of these essentially negative findings, it was considered that infection as the etiologic agent was highly unlikely.

After leaving the hospital she was examined at frequent intervals in the office. The pupils rapidly returned to normal. The retinal edema further cleared and vision continued to improve. On April 11 vision was 16/200 in the right eye and 20/200 plus 1 in the left eye. Visual fields were normal in outline and showed several small paracentral scotomata but no central scotomata. These scotomata corresponded generally with the areas of pigmentation. On April 22 corrected vision was 20/50 in each eye. However, there followed a slight relapse for two days, during which the eyes became tender and pained and vision fell to 20/200 and 20/65. This loss was rapidly regained during the next few days. On June 5 her vision was 20/30-1 in each eye. The fundi and visual fields had not significantly changed. There was a 60 decibel hearing loss in the right ear. Pulse rate and rhythm were normal.

Until April 2, twelve days after the onset of symptoms, we were completely in the dark as to the etiology, when the patient volunteered the information that on the night previous to the onset of her symptoms she, with her husband, set out for a night of celebrating. They visited several hotel bars and night clubs and had eight or ten "or more" drinks of a mixture of bourbon whiskey and coco-cola. At the last stop, at a club of rather unsavory reputation, the patient complained that her drink tasted bitter and made her rather nauseated. She did not finish it for this reason. This revelation, together with the

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CASE REPORT

quite typical delayed onset of symptoms and course of the illness, led to the suspicion that her last beverage may have been contaminated with methyl alcohol.

Discussion

Methyl alcohol even in small quantities is known to produce severe grades of blindness. Ziegler⁷ stated that one teaspoonful has been known to cause blindness. Methyl alcohol is a common adulterant of cheap liquor. It is incompletely oxidized in the body to formaldehyde and formic acid and the latter is very slowly eliminated. The formic acid is thought to produce an acidosis. Either formaldehyde or formic acid have been shown by Fink to act similarly to methyl alcohol itself and to produce, in animals, lesions in the ganglion retinal layer indistinguishable from those produced by methyl alcohol. The onset of symptoms in the writer's case—severe headache, orbital pain, nausea and vomiting twelve to fifteen hours after ingestion of a suspicious beverage—are quite characteristic. The sudden severe loss of vision, the dilated fixed pupils, and the rapid subsidence of these symptoms compared quite closely with most recorded cases of proven methyl alcohol poisoning in which recovery has occurred. Deafness has also been recorded many times.

Formerly, methyl alcohol was classed with other toxic agents, such as quinine, lead, ethyl alcohol, tobacco, carbon disulphide, iodoform, and arsenic compounds, which have a predilection for the retrobulbar portion of the optic nerve and, particularly the papillo-macular bundle and thereby give rise to central or caecocentral scotomata. In such cases, classified as retrobulbar neuritis, the ophthalmoscopic picture is essentially negative or there may be seen only pallor or hyperemia of the optic disc. In many cases of methyl alcohol poisoning the toxin has acted in this manner. But there are other recorded cases which have not conformed to this picture. Moreover, histological studies in fatal cases have demonstrated that the chief and perhaps the primary lesion is in the ganglion cell layer. Birch-Hirshfield¹ concluded after histological studies that the primary lesion is in the ganglion layer and that damage to the nerve is secondary to death of the ganglion cells. Fink,³ in experimental work on dogs and rabbits, has found extensive changes in the ganglion cells and relatively little damage to the nerve fibres. Schwartz,² who studied two cases histologically, found no damage to the optic nerves but found retinal changes which he considered responsible for the blindness. Menne⁴ sectioned one eye from each of twenty-one fatal cases. I shall quote from this report: "Microscopically little change was observed in the optic nerves except for edema and hyperemia and some patchy proliferation of glial cells. The most prominent alterations were observed in the ganglion cells of the retinas: irregular staining, eccentric placement of nuclei, fraying of cytoplasmic outlines, vacuolation and autolysis. In many instances only about one in fifty of the cells approached normal, while in some eyes they were entirely absent in wide areas. These changes in the ganglion cell layer were most marked nearest the disc."

From these reports of histological studies, all of which emphasize extensive destruction to the retina, one should expect to see some ophthalmoscopic evidence of this pathologic condition in cases of methyl alcohol poisoning. One wonders if this evidence isn't often overlooked, as the great majority of cases reported were not studied by ophthalmologists. With the pupils widely dilated, the early retinal edema in the writer's case was overlooked by an intern until it was pointed out. Furthermore, as a large percentage of such patients die in the first few hours or days, pigment has not had time to migrate to the inner layers of the retina where it can be seen. In mild cases rapid recovery of a large percentage of vision might distract one from a careful study of the retina.

One may wonder why two or more people imbibing the same adulterated beverage would not be similarly poisoned. In answer to this, Casey Wood⁶ stated that "Methyl alcohol is an example of idiosyncrasy. Some persons are largely immune as far as permanent damage to the organism is concerned. Of ten persons drinking 4 ounces of methyl alcohol within three hours, all will have marked abdominal symptoms and probably four will die. Six will recover, and two of these will be blind." It would seem that some individuals are capable of more completely oxidizing and eliminating methyl alcohol than others.

Merritt and Brown⁵ reported a patient poisoned by methyl alcohol who had an attack resembling coronary occlusion on the way to the hospital. They found electrocardiographic changes and felt that the acidosis produced may have had a profound effect on the heart. The writer's case had a marked arrhythmia at the height of the toxemia, which disappeared by the time the patient left the hospital.

Summary

In summary, a case of rather severe toxic amblyopia, accompanied with headache, orbital pain, vertigo, nausea and vomiting, has been reported. The paramacular regions of the retinas showed patchy edema becoming diffuse and later replaced with superficial patchy pigmentation. Approximately 90 per cent of vision was recovered. The etiology is unknown but the symptoms and course closely parallel the picture of mild methyl alcohol poisoning. References are cited to show that retinal pigmentation is not necessarily incompatible with lesions produced by this agent.

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History of Medicine In Minnesota

NOTES ON THE HISTORY OF MEDICINE IN FILLMORE COUNTY PRIOR TO 1900

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(Continued from January issue)

Frans Josef (later these names were anglicised to Francis Joseph) **Van Mackelenbergh** was born on April 7, 1834, in the historic city of 'S Hertogenbosch (Bois le Duc), in North Brabant, Holland, one of the five children of Frans Van Mackelenbergh and his wife. The Van Mackelenbergh family came of an ancient line in Holland; for many generations its members have been wholesale dealers in hardware, a firm whose traveling representatives have been known in every civilized country of the world except the United States. Of the Roman Catholic religion, the family has been characterized by devout faith and by generous giving to the church, both of its wealth and, in all generations, of its men and women to serve as priests and nuns. Since World War II started, nothing has been learned directly of the present representatives of the family in Holland and their interests; a Dutch refugee, a young woman who escaped to America via France and England, told members of the American branch (in 1943) that everything in the region in which the family resided had been confiscated by the enemy.

Frans Josef Van Mackelenbergh and his brothers received their early education in 'S Hertogenbosch, probably at the famous old grammar school at which Erasmus (1466-1536) once was a pupil. It was expected that in due time Frans would join his brothers, John, the eldest, Ambrose, and a third in the conduct of the wholesale hardware enterprise, and in preparation for this career and for the extensive traveling that would be part of it, he mastered five European languages, including English. When he was a young boy, he was busy during the summers in his father's business establishment; a few years later his vacations were spent in both educational and commercial pursuits when he acted as a salesman in the business, traveling through Europe and, on one occasion, to the Dutch East Indies. Already it had become evident, however, that business was irksome to Frans Josef and that he was interested rather in medical science, and accordingly his father sent him first to the University of Leyden to study in its world-known school of medicine and later to a medical school in France.

During his months in the Dutch East Indies and on the Malay Peninsula, in 1854, the student availed himself of the opportunity for scientific medical research and thereby obtained much interesting and useful knowledge. On the return voyage to Holland the ship was wrecked in a tropical storm and it was only after weeks of drifting in life boats (the entire voyage consumed three months) that the little group of survivors, of which Frans Van Mack-

elenbergh was a member, was rescued and taken to the island of St. Helena, off the southern coast of Portugal, until transportation home could be arranged. Correspondence of that period, preserved in the family records which recently have been translated into English, includes a letter from Frans' mother dated on January 7, 1855, which makes it clear that the boy had written home after a long absence and that news of him had given great joy to his family. In the following March his mother wrote with much concern regarding a dangerous illness from which Frans happily was recovering; this is the letter of a loving and devoutly religious mother. Another letter from her in the same month states that the visit which one of his brothers had intended to make Frans had been prevented by the most severe winter ever known in Holland. By April the traveler was able to return home.

Within the next decade there were changes in the family circle and in personal plans. The senior Frans Van Mackelenbergh died, as did one of his sons and a daughter. The eldest son John with his brother Ambrose succeeded to the headship of the family's mercantile company. Frans Josef Van Mackelenbergh, on his return from the East Indies, definitely had allied himself with the profession of medicine and had become a well-qualified physician whose chief professional interest then, as later, lay in the study of and treatment for chronic diseases. By the early sixties he had begun to look toward America as a new home and field for work and in 1866, immediately after his marriage to Magdalene Van Velthoven, like himself a member of a native Dutch family long in Holland, he sailed with his wife for America, en route to a Dutch settlement at Beaver Dam, Wisconsin. Arrived at Beaver Dam, Frans and Magdalena Van Mackelenbergh were disappointed to find that the Hollanders of that settlement were from a different province of The Netherlands than themselves and that variation in language made communication difficult. Having a friend, a Mr. Davis, in Waupun, Wisconsin, the young couple moved to Waupun for a few months, and in that village, in 1867, was born their first child, Francis Josef. Presently the little family moved to Chicago, where Dr. Van Mackelenbergh entered medical practice; in Chicago for a period of some length Mrs. Van Mackelenbergh, with the baby, lived at a convent where among the nuns she learned to speak English and to accustom herself to the strange manner of American life. It was during the years in Chicago that the second son, Ambrose, was born; this child died in infancy as the result of an accident when his nurse let the baby carriage plunge from the sidewalk over a high embankment. In 1871 a third child, Agnes Frances, was born.

Chicago was not a fortunate home for this family. There they first knew great sorrow. There, toward the end of their residence in the city, in 1870 or 1871, Dr. Van Mackelenbergh late one night as he was returning from a sick call was set upon by thugs who beat him severely and robbed him. And in the great Chicago fire of October 8 and 9, 1871, all their household goods and the doctor's offices and his entire professional equipment of books and instruments were destroyed. There remained to Dr. and Mrs. Van Mackelenbergh only the box of family goods and heirlooms which by happy decision they had left with their friend, Mr. Davis, in Waupun.

At this time of misfortune Dr. Van Mackelenbergh heard about an opening for a physician in the little hamlet of Greenleaf, York Township, fifteen miles southwest of Preston, in Fillmore County, Minnesota, and to this community, which had been founded in the fifties by a group of Pennsylvanians, representatives of the Dutch Reformed Church in America, Dr. and Mrs. Van Mackelen-

bergh came with their two children early in 1872. Again they encountered the embarrassment of difference in native language and, perhaps, lack of sympathy in religious belief, inasmuch as they were faithful Roman Catholics and Greenleafston was a settlement of Protestants. And again they sought a new location, which they found close at hand, in the village of Forestville. This little settlement was the center of a thriving and promising community of many substantial pioneers, the owners of good farms and comfortable homes. The village had an outstandingly fine general store and a flour mill, with the usual complement of mills of other types. In Forestville Dr. Van Mackelenbergh and his family were welcomed warmly and there they established their home and the doctor entered medical practice. In his old papers there appear the names, as friends and patients, of families that for generations have been well known in the county: Le Fever, Meighen, Foster, Storm, Reidell, Roeder, Kirvin and Winters, among others.

Dr. Van Mackelenbergh settled in Forestville about a year after Dr. Russell L. Moore had removed from the village to Spring Valley and probably at about the time that Dr. Henry L. Wilson moved to southwestern Minnesota. From the beginning he worked beyond his strength under the severe conditions of country practice of those years. At the time of his arrival there was in the community an epidemic of smallpox and subsequently there were sporadic outbreaks of diphtheria. He cared for the victims of these and other communicable diseases; dealt with chronic diseases, in which, it has been noted, he was particularly interested; with surgical emergencies; and with obstetrical cases. He sat up many nights in succession to watch by bedsides because nurses were few; cases are recalled even yet in which his skill and knowledge saved patients whom other physicians had given up to die. Because, other than the main stage route through Forestville, roads in the community were practically nonexistent, he traveled across fields and pastures and up and down the endless hills in horse-drawn sulky or buckboard or on horseback with his instruments and medicines in saddlebags. With all his gentleness to family and patients and his forgetfulness of self, he was a proud man; he loved to drive horses of pride and spirit equal to his own, and these horses, no more inured than himself to pioneer life, sometimes in their fright ran away and thereby endangered him twice over; on several occasions he was chased by wolves, twice he nearly froze to death.

In 1874 Dr. Van Mackelenbergh moved from Forestville to Spring Valley, perhaps because the former village had been left to one side by the Southern Minnesota Railroad and its fortunes unmistakably were declining, and because prospects were better in the latter settlement, which had become a railroad point. In Spring Valley, Spring Valley Township, on the western border of the county, knowledge of his skill in treatment for chronic diseases had preceded him and there he made many new friends. It was then that his professional card appeared in the local newspaper, *Western Progress*: "F. J. Van Mackelenbergh, Physician. Office at Cobb's Drugstore and at residence, two blocks south of the school house." In the next few years his announcements appeared intermittently, as did those of contemporary physicians, and it is worthy of note, for historical record, that in the printing his name underwent various changes and corruptions, as thus: F. G. Mackelenbergh; F. J. Van Mecklenbergh; and F. G. McLenbergh. In this period also he was a patron of Andreas' "Illustrated Historical Atlas of the State of Minnesota," published in 1874, in which there appeared the entry: "T.

J. Van Mackelenbergh, physician and accoucheur." In the issue of 1880-1881 of a state gazetteer and business directory his name appeared correctly, but in the official register of physicians who were licensed in Minnesota during the period from 1883 to 1890, inclusive, in the section by counties, there is only the entry, "Exempt. Mecklenberg. Wykoff." It is recorded among documents in the possession of his family that after the passage of the medical practice act of 1883 Dr. Francis Joseph Van Mackelenbergh was licensed to practice medicine in the state under an exemption certificate.

Although Dr. Van Mackelenbergh prospered professionally in Spring Valley, it was there that the years of arduous practice began to take their toll of his health. And it was in 1880 and 1881 that little Agnes Frances began to give her father the help that was to continue the remainder of his life; driving his horses, sitting with him at the bedsides of patients, aiding him in the procedures of treatment and nursing. It is small wonder that after sixty-two years, memories still should be vivid of the pounding on the Van Mackelenbergh door at night when a relative of some sick person dashed up, usually on horseback, to summon the doctor; of the crawling out of bed and going into the dark barn to hitch up the horses, and of the driving out into the night. One trip after midnight was to the village of Fillmore, six or seven miles to the northeast, on the Root River, to attend an old soldier who was in great pain. Incidentally, payment for this visit never was made, and there were many comparable trips and many equally unprofitable visits to numerous patients in a widespread practice. Furthermore, the years in Spring Valley brought renewed and deep sorrow to the Van Mackelenbergh family. It was there, in 1879, that the eldest child, Francis Joseph (Frank), died at the age of twelve years, and that the fourth child, Roman Aldus, who was born in Forestville, on December 22, 1872, died at the age of ten years. Both children were buried in the Catholic cemetery at Carimona, in Carimona Township. Not long after the death of Roman Aldus the family moved, probably in the late summer of 1882, because of their grief, from Spring Valley to Wykoff, in Fillmore Township, about eight miles east of Spring Valley and about the same distance northwest of the former home in Forestville. In Wykoff sorrow pursued them, for in that village, on March 7, 1886, died Alphoso, the only remaining son, in his tenth year; burial was made in the Catholic cemetery at Carimona.

At Wykoff the hardships of county practice were not abated. There were continual exposure to weather; arduous trips on horseback or in vehicles over rough roads; lack of Sundays, holidays and recreation; lack of rest and sleep and proper food, because this physician, like many another early practitioner, took his meals when and where he could during his long rounds. The toll was heavy and Dr. Van Mackelenbergh's health progressively failed.

Francis Joseph Van Mackelenbergh died in Wykoff on March 18, 1892, in his fifty-eighth year. He was buried in the Catholic cemetery of the village. Some years subsequently his widow, Magdalena Van Velthoven Van Mackelenbergh, was married to Robert M. Foster, of Forestville. She died on April 26, 1921, aged seventy-seven years.

In 1943 the one surviving child of Dr. and Mrs. F. J. Van Mackelenbergh was their only daughter, Agnes Frances Rau, wife of George J. Rau, of Adams, Mower County. There were living also three granddaughters of the pioneer physician and his wife: Mrs. A. J. P. (Clara) Jelnik, of New Prague, Minnesota; Mrs. Alyce Vick, of Anoka, Minnesota; and Mrs. L. D. (Margaret)

McGuire, of Omaha, Nebraska. The great grandchildren were, in the Vick household: A. Thomas, Mary Jayne, Frances Ann and Marjean; and in the McGuire family: Richard, Terrance, Lawrence and Michael.

T. Veenschoten in the eighties is believed to have been physician and postmaster at the hamlet of Greenleaf, in section 1 of York Township, fifteen miles southwest of Preston. The little settlement was founded early by a group of pioneers representing the Dutch Reformed Church and it "was named in honor of Miss Mary Greenleaf, of Philadelphia, who generously gave three thousand five hundred dollars to build the Dutch Reformed Church edifice." Dr. Veenschoten's name has been observed by the writer only once.

Lyman Viall was born in New York State on December 18, 1818, and was one of a family of seven children, his brothers being Milton, Frank, Mulford and Andrus and his sisters Hulda and Aurella. He received his early education in the schools of his native place and when a young man came with other members of the family into the Mississippi Valley during the exodus from east to west that took place in the middle decades of the nineteenth century. Two of the brothers, Frank and Andrus, settled eventually in Wisconsin and another two, Milton and Lyman, in Minnesota.

It is probable that Lyman Viall received his medical training primarily under a preceptor, as was the custom at that period. Subsequently he studied at a medical school of the regular system in Chicago, perhaps, it has been suggested, at Rush Medical College. His name has not been observed in medical directories or in medical registers.

Dr. Viall first practiced medicine in the vicinity of Downer's Grove, Chicago, for an unknown number of years. By an early marriage, either in the East or in Chicago, he had two children: Mary (afterward Mrs. Ober) and J. Burke Viall. After the death of his first wife he was married, on October 5, 1858, at Brush Hill, Illinois, sixteen miles from Chicago, to Helen C. Gage, who was a native of Wood County, Ohio, born on November 29, 1831. Of the second marriage there were four children: James Gage, Bard Ellsworth, Ralsy Edward and Harry Lyman. In adult years James Gage became a brick layer, Bard Ellsworth a banker, Ralsy Edward an employe in the steel mills and Harry Lyman an electrician.

Dr. Viall has been mentioned as being in Winona, Minnesota, in the late fifties, and it was not long after that time, in 1860 or 1861, that he settled on a farm three miles north of Spring Valley, Fillmore County, in the community in which his brother, Milton Viall, also established a home. For nearly ten years Dr. Viall farmed, applied his skill as an excellent carpenter and, from his home as an office, carried on a general medical practice, locally and at considerable distances as required. He must have had unusual success in treatment for smallpox, because he has been recalled in the region as a "smallpox specialist"; and in a subsequent period, in Preston, much of his professional activity had to do with the disease. One of his sons has the vivid memory from childhood years of seeing his father many times ride away on horseback and of knowing that his destination was a home where someone had smallpox. Dr. Viall himself, when yet in Illinois, was a victim of the disease. The local authorities placed him in the pest house and there he underwent a serious illness and a stormy convalescence, stormy in more senses than one, for the roof of the pest house was not weatherproof and during heavy rainstorms the

water poured through upon the patient. It may well have been that his interest in smallpox and the proper care of sufferers from the disease dated from that time.

Early in 1869 Dr. Viall settled in Preston and in March, on the outbreak of smallpox in the village, he promptly was constituted health officer, the house in which the patients lay was declared a hospital by the local board of health, and Dr. Viall was "required to procure suitable nurses for the sick in said hospital and to do such other things as may be necessary under the premises." His interest and success in the treatment for smallpox continued throughout his practice, as evidenced by many notes in the local newspapers. In June, 1882, the *National Republican* commented that Dr. Viall had another smallpox case on his hands. The patient was one of a Norwegian family of eight or nine children, none of whom could be induced to be vaccinated. The editor added that "they think the doctor is working up a system out of which to make money. . . . Proper precaution is indicated."

Among Dr. Viall's numerous medical contemporaries in the village were Lafayette Redmon, John A. Ross, Henry Jones, O. A. Case, George A. Love and, in the early eighties, J. H. Phillips. Dr. Viall was a member of the Universalist Church, a good and respected citizen, reliable in his professional work and in the conduct of his business interests. He was the owner of his home and of other real estate. Two of his outstanding characteristics were that he read widely, especially history, and that he always was well groomed and so smartly clothed as to be called dressy.

After fifteen years in Preston Dr. Viall died on September 23, 1885, of "paralysis of the brain," his son has stated. After his death Mrs. Viall, an intelligent and able woman who had always been interested in medical matters, took up midwifery and practical nursing and for several years served the community successfully as a skillful practitioner. Helen Gage Viall lived thirty-eight years after her husband's death and died in Preston on November 16, 1923.

In 1943, of Dr. Viall's immediate family there were living his sons, James Gage Viall, of Phoenix, Oregon, and Ralsy Edward Viall, of Granite City, Illinois, and their twelve grandchildren, several great-grandchildren and nieces and nephews.

P. Von Lackum, "physio-medical physician and surgeon," settled in Preston in December, 1869, and announced that he used no noxious substances whatever in his practice and claimed for his system of medicine more efficacy against disease than that of any other.

Early in 1871 there appeared at considerable length in the local *Republican* editorial versions of one of Dr. Von Lackum's cases that made most interesting reading. It seemed, on first account, that the practitioner was called to see a Norwegian girl, living at home in a neighboring community, who suffered greatly, her distress manifested by writhings and contortions; that the doctor decided that she had drunk water from a pond containing "wiggle-tails"; that the creatures subsequently had changed to frogs in great numbers within her stomach; that the doctor wished to open the stomach; that the parents of the girl refused the operation. After much speculation the reporter challenged science "to vindicate" if frogs actually were in the stomach, "by showing how they came to subsist there through the gradations from the diminutive wiggle-tail to a full grown croaker with propagating powers other than those

it would enjoy in the bogs and ponds in which it has, from time immemorial, given its delicate note to the night breeze." All was made clearer a few weeks later by the following communication from the patient's brother, published at the doctor's request: "I hereby certify that Dr. Von Lackum never said there was frogs in my sister's stomach. The doctor said that it might be a frog or a lizzard. The doctor never called other physicians for a consultation in this case and never said anything about operating on her. Dr. Von Lackum was called for consultation after the other physicians could not make out what her ailment was."

The editor added, regarding Dr. Von Lackum: "He also unhesitatingly affirms it as his belief that snakes, toads and lizards may subsist in the human stomach to the great discomfort of those who may become burdened with them, in view of which we reiterate the opinion that Dr. Von Lackum is in error and science must vindicate."

Evidence did not appear that this practitioner afforded further challenge to science. His professional cards were not noted by the writer in issues of local newspapers subsequent to March, 1872.

This absurdity is given because of its obvious significance. In Minnesota, as elsewhere, there were practitioners of sorts who prospered until adequate acts to regulate medical practice came into effect.

In 1874 there was residing in the city of Winona, Winona County, Dr. Peter Von Lackum (since said to have been a botanic physician and surgeon), who practiced there about four years. This man came from Germany and first settled in Minnesota in 1864, according to Andreas' *Historical Atlas* of 1874. It is probable, but unproved, that this man and the physio-medical physician and surgeon of Preston were the same.

Charles Carroll Walker was born in 1870 at Kilbourn City, Wisconsin, the son of Luzern Walker and Christiana McCumber Walker, both of whom were natives of New York. There were four other children, all boys, William E., L. T., F. H., and Raymond M. Walker.

Charles Walker obtained his early education in the schools of Kilbourn City. Immediately after his graduation from the local high school, in 1888, he had a year of academic and premedical work at Lawrence University, at Appleton, Wisconsin, and subsequently matriculated at the Northwestern University Medical School, from which he was graduated in 1896.

Licensed in Minnesota by examination, in 1896, Dr. Walker practiced two years in Winona before settling, in 1898, in Chatfield, Fillmore County. In 1900 he moved to Lamberton, Redwood County, where for the greater part of the last forty-three years he has been engaged in general medical practice. In the summer of 1906, then in Currie, Slayton County, he took a postgraduate course in Chicago before returning permanently to Lamberton. He is a member of the Methodist Church, has served on the city board of health, and in 1918, in World War I, was a captain in the Medical Corps of the United States Army.

On June 4, 1903, Charles Carroll Walker was married to Julia Cole, of Chatfield. In 1943, of Dr. and Mrs. Walker's three children, Charlotte was deceased, Kathryn was Mrs. W. J. Smith, of Denver, Colorado, and Harold E. Walker, of Duncan, Oklahoma, was in the United States Army.

(To be continued in March issue)

President's Letter

IT'S YOUR ASSOCIATION

The Minnesota State Medical Association, like any democratic body, can best fulfill its function and objectives if its individual members are all fully aware of the makeup and mode of operation of their representative group. The State Association is a federation of thirty-three county medical societies throughout the state, having a membership of more than 3,000 physicians. It is a constituent state unit of the American Medical Association.

The most important figure in the Association is not the president, but the individual practicing physician. He is the fundamental unit of the entire structure of organized medicine at all levels—national, state and local—for that is the way in which free men organize themselves democratically. Authority does not come from the top down; authority springs from the individual member, who through his county medical society makes his ideas and desires known.

The most potent force in the State Association is the local county medical society. Each local society elects delegates who in turn compose the House of Delegates. Supreme authority is vested in the House which meets annually at the time of the annual scientific meeting (unless called into special session). This body is presided over by an elected speaker. In addition, the House of Delegates elects a council, which in the interim has full power and authority. The Council consists of nine members—one member from each of the nine councilor districts plus six other *ex officio* members who may sit with the Council but who do not have the right to vote. These are the president, the immediate past president, the president-elect, the secretary, the treasurer and the speaker of the House of Delegates.

Association affairs are managed by a full-time executive secretary and his staff of assistants, with headquarters at 496 Lowry Medical Arts Building, Saint Paul. Your Association is to be complimented on having at the present time one of the finest executive secretaries in the country, and much of the success of the organization can be attributed to his diligent and untiring efforts. Every member should make a point of becoming acquainted with the executive secretary. His duties consist of carrying out the directions of the House of Delegates, the Council and the thirty-nine appointed scientific and economic committees.

The state office is working full time for the interest of the medical profession and furthering the activities of the Association and is anxious to give assistance in any way possible to any member who desires it. For example, the office maintains a speakers' library, material from which can be sent to physicians on request when they have been called upon to address a lay group and desire accurate up-to-date information to use in preparing a talk. The headquarters office keeps an alphabetical file of Minnesota physicians with whatever biographical data is available on each one. There is also a placement service for physicians seeking locations or looking for assistants or associates. Suggestions from members on how the program of the Minnesota State Medical Association can be improved or expanded are welcomed. Effort is

made to acknowledge all such communications promptly, and matters requiring consideration by the Council or a committee will immediately be referred to the proper group.

In addition, the Association maintains the services of a trained and skillful attorney, who is responsible to the Council and is actively engaged in handling the legal matters pertaining to the activities of the Association.


With his license to practice, with the approval of his fellows and with all of the qualifications for membership defined in the Constitution and By-Laws adequately met, a physician becomes a member of the medical society of the county or district in which he resides. This automatically makes him a member of the State Association. From that point it is his responsibility to keep his membership, to see that he gains the maximum amount of benefit from this membership and to make a genuine effort to contribute to the work of the organization. It should be the duty of each member to take a vital interest in the affairs of the State Association, for by so doing he has his best opportunity to keep abreast of medical developments and to improve his service to his patients and humanity. As a member of a scientific committee he can help educate the public in health matters in many different fields. By service on an economic committee he can help stimulate such activities as the extension of medical service in rural areas or see that sound health legislation is passed which will safeguard the health and welfare of the people of the state. A physician can also make valuable contribution by serving as a delegate from his society, as a Council member or as an Association officer.

The activities of the Association are many and varied. The annual scientific meeting attempts to provide its members with one of the best-rounded medical programs possible. Through MINNESOTA MEDICINE, the official journal, members have the opportunity of reading one of the finest state journals published. Not only does it provide scientific information, but also pertinent news on a national and local scale, to keep members posted on all current matters. A monthly news letter further augments this information. Every member should give his most careful attention to these if he wishes to contribute to the organization and derive the benefits it has to offer.

The Association also provides speakers and exhibits for lay gatherings; distributes sound, scientific health information to the press and radio; distributes literature and co-operates with and supplies professional advice and guidance to responsible official and voluntary agencies and organizations whose activities also lie in the health field.

It also provides members with an opportunity to join in organized action on matters pertinent to public health and medical practice, serving as a clearing house for information for members of the medical profession and, to some extent, the lay public as well.

The local societies and the State Association will be only as active, alert and effective as are the individual members. No member is too young or too old to serve, or to give his ideas on how the program of the Minnesota State Medical Association can be improved or expanded. Your interest and suggestions are essential to the success of the group. It's *your* Association.



President, Minnesota State Medical Association

Editorial

CARL B. DRAKE, M.D., *Editor*; GEORGE EARL, M.D., HENRY L. ULRICH, M.D., *Associate Editors*

TRENDS IN MEDICAL PRACTICE

IT is sometimes possible to see certain trends in the practice of medicine. When such a trend is not a healthy one, attention should be called to it so that it can be corrected.

The average physician enters the practice of medicine because of interest in the science and art of medicine and because he has a certain altruistic desire to be of service to people. This is as it should be and should be the universal urge in selecting medicine as a vocation. One who selects medicine as a road to wealth is most likely doomed to disappointment. Only the very few acquire wealth in the practice of medicine. Those who do are likely to pay for their financial success in overwork and short lives.

On the other hand, the practice of medicine offers a good living to the industrious and serious minded physician. This is particularly true in the case of general practice, whether the young physician settles in the city or the country. With the present-day surge among recent medical-school graduates towards specialization, it can be safely predicted that a certain proportion of specialists who are for the most part located in the larger centers of population will be forced for economic reasons to shift to general practice in locations where they are needed.

While we do not decry the obvious need for specialization in medical practice and the desirability of certification of specialists by National Boards, specialization is being overdone. Greater financial compensation of certified specialists, obvious in government payrolls, has doubtless been the main factor in the overproducing of specialists. Government financing of GI's in enabling them to specialize, while possibly a temporary factor, accounts for the situation in some hospitals where there are two residents training for the specialties for every intern. The obvious remedy is the limitation of available residencies. We feel sorry for the young doctor who invests three to five years of training in a specialty when a year or two in preparing for general practice would have been the wiser choice. A few years of

general practice enables the young doctor to know better what specialty to choose and, in our opinion, a general practitioner should be given preference in the filling of residencies. One who has been in general practice knows that there is more to a patient than that organ or organs with which he as a specialist deals.

One of the regrettable results of specialization is the frequent difficulty a sick and perhaps acutely ill person often has in obtaining prompt medical care even in a large city that boasts hundreds of doctors. The doctor called is a specialist, and from the description of the symptoms, the case is not in his line or he doesn't make house calls or night calls. Instead of having any feeling of responsibility as a member of the healing profession in seeing to it that the patient contacts a general practitioner who will respond to the call, he hangs up the receiver. What a simple matter for the specialist to have the names of several general practitioners to whom he can refer calls. Or are general practitioners already so scarce that he knows of none?

We talk about the need of improving our public relations and the need of contributing to the support of publicity agents who will extoll the accomplishments and virtues of the profession, when the very best public relations are established by the individual physician in his relations with the public. As someone has said, adherence to the Golden Rule by every member of the profession would obviate the need for any other public relations agency. Are we losing some of the idealism which has always been a part of medicine and has distinguished medicine as a profession in contradistinction to a business?

The laborer is worthy of his hire, but financial return should be secondary to service.

AMERICAN RED CROSS

IN March, the Red Cross will again collect funds to support its various relief activities. Americans gave generously to the Red Cross during the war and will doubtless continue to support

it in contributions of time and money during peacetimes.

During 1947 the Red Cross assisted the sufferers from the Texas City disaster with more than \$1,000,000 and the September hurricane victims with an additional \$1,000,000. During the first ten months of the year, a sum of over \$9,500,000 was appropriated for the disaster sufferers. More than 2,000,000 cases involving veterans and their dependents were handled during the past year, involving nearly \$12,000,000 in expenditures. In addition Red Cross personnel are making life brighter for inmates of veterans hospitals. Educational classes in first aid and the blood banks which are getting under way are other worthwhile activities of this famous organization. *Give!*

MEDICAL COSTS AND OTHERS

FRANK G. DICKINSON, Ph.D., Director of the Bureau of Medical Economic Research of the American Medical Association, has made an interesting analysis of medical costs in recent years in relation to certain other living costs. He divides medical costs into those for physicians' services, hospital and other medical costs. The costs of physicians' services include only those in private practice, and the hospital item includes only payments to proprietary hospitals and the operating expenses of nonprofit hospitals.

He shows that by 1945, the expenditures for physicians' services had increased over the average expenditures for the years 1935 to 1939 some 163 per cent; hospitals, 180 per cent; and total cost of medical care, 188 per cent. By comparison, expenditures for alcoholic beverages had increased over the same period, 248 per cent; recreation, 253 per cent; tobacco, 176 per cent; personal items, 229 per cent; and jewelry, 380 per cent. He shows that in comparison with expenditures for the items mentioned the amount spent for physicians' services has increased the least. Or to put it in dollars, the amount paid in billions for physicians' services increased from 0.8 for the basic period of 1935 to 1939, 1.3 in 1945; for hospitals, from 0.4 to 0.8; medical care from 2.6 to 5 billions. During the depression years, the cost of physicians' services, hospital care and total medical care took the highest percentages of the personal income that it has since 1929. This is to be expected, as the services of physicians and hospitals are in the nature of a necessity.

This finding of less fluctuation in the income

of physicians as a whole, in comparison to other items, is in keeping with experience. Many physicians have not increased their fees at all, others only moderately, although the overhead cost in their practice has increased some, and, of course, their cost of living has about doubled, as it has for everyone else. Medical fees paid by insurance companies and for industrial work have remained stationary for the most part, and these rates set a standard to some extent for private practice.

The following figures are of interest. The total consumer expenditures of 143.7 billions in 1946 were approximately double the figure of 72.1 billions in 1940. This includes 8.8 billions spent in 1946 for alcoholic beverages as compared with 3.6 billions in 1940; 7.9 billions for recreation in 1946 compared with 3.7 billions in 1940; 5.6 billions for total medical care in 1946 compared with 3.1 billions in 1940; 1.4 billions for jewelry in 1946 compared with 0.5 billions in 1940; all this compared with 1.5 billions spent for religious and welfare activities in 1946 compared with 1 billion spent in 1940.

These figures do not mean that we as a nation are drinking twice as much alcoholic beverages as six years ago. Much of this item is due to high cost of production and higher taxes. They do not suggest, however, that we are drinking any less. We apparently must have our liquor whatever the cost. To spend nearly six times as much for liquor, five times as much for recreation and nearly as much for jewelry as we spend for religious and welfare activities combined does not speak well for our ideas of relative importance.

As Dickinson says: "Medical care is expensive; it is becoming more expensive; yet as a percentage of national income in a period of frenzied prosperity, it is a shrinking item. Medical care is expensive, but patients are getting more for their money in terms of longer life."

THE MINNESOTA CANCER CONTROL PROGRAM

AS Minnesota physicians are aware, never before in history have such extensive and well-planned efforts been directed at seeking the cause and cure of any disease as are now being leveled at cancer. In Minnesota, the cancer program has recently been expanded by setting up, in the State Department of Health, a Division of Cancer Con-

trol, established when federal cancer funds were made available to state health departments in 1945.

Despite the fact that large sums of money are being spent on cancer research and many highly skilled persons are diligently seeking for clues to a solution of the problem of cancer, we still have to rely on time-tested, though none too satisfactory, procedures for treating cancer. Prevention is still a hope for the future. Early detection and early, adequate treatment are the only measures that offer real hope at present of reducing our high cancer mortality.

Definite progress has been made toward early detection through educating the lay public to be on the alert for early signs of cancer and to report such signs promptly to their physicians. But that is only the first step. The second step, equally important, consists of providing prompt and effective treatment. That step must, of course, be taken by physicians themselves. They must be ready and able to apply all measures necessary to determine if cancer is present. This they can do only if proper facilities for examination are available, including special training for the physician if necessary. If prompt diagnosis is made, then early treatment will follow as a matter of course.

In co-operation with the Cancer Committee of the Minnesota State Medical Association and the Minnesota Division of the American Cancer Society, the Minnesota Department of Health is now setting up a program that will aim to meet the requests of physicians for greater knowledge concerning cancer. This program will undertake to provide:

1. Educational opportunities for graduate students in cancer
2. Refresher courses on cancer for practicing physicians
3. Speakers on cancer control for meetings of medical societies and hospital staff meetings
4. A correspondence consultation service for physicians

The Cancer Control Division of the Health Department is also undertaking, through hospital reporting of cancer cases, a statewide statistical study of the incidence and distribution of cancer. The information gained from this study will be made available to physicians as rapidly as significant data are accumulated.

DEAN S. FLEMING, M.D., M.P.H.

Dr. Fleming is Chief of the Section of Preventable Diseases, Minnesota State Department of Health.

MEDICAL MOTION PICTURES

IT is not generally known that the Committee on Medical Motion Pictures of the American Medical Association has some 4,000 motion pictures available gratis, except for transportation charges, for use at medical meetings—hospital staff, county or state. About 50 per cent of them are sound pictures, most of them on the postgraduate level. The service was organized in 1945, reviews of new acquisitions appear in the A.M.A. Journal, and a catalogue is available for use in selection of the subject desired. At present, most films presented at medical meetings are those furnished by pharmaceutical houses. Society secretaries interested in securing the AMA pictures should write Mr. Ralph Creer, Secretary of the Committee on Medical Motion Pictures at A.M.A. headquarters, 535 North Dearborn Street, Chicago 10, Illinois.

RESEARCH PROJECT ON CARDIOVASCULAR DEGENERATION

The Laboratory of Physiological Hygiene of the University of Minnesota's School of Public Health is undertaking a long-term study of physiological factors involved in human cardiovascular degeneration (arteriosclerosis and hypertension). Special attention is being given to the effects of dietary and activity habit, and efforts are being made to include some evaluation of personality characteristics. This project is sponsored by the U. S. Public Health Service, acting on the recommendation of their cardiovascular advisory committee (Dr. W. Cowles Andrus, chairman). The program has been endorsed by the Heart Committee and the Council of the State Medical Association and the Ramsey and Hennepin County Medical Societies.

A major part of the program consists of systematic periodic examinations and tests of men who are "normal" at the time of their first examination. In a total of 500 men who are participating approximately 200 are University students (eighteen to twenty-six years of age) and the remainder are businessmen recruited from the Twin City area whose ages are forty-five to fifty-four, inclusive.

The examination, which takes about four hours, includes the following items: (1) special history and physical examination, designed to reveal cardiovascular abnormalities; (2) electrocardiogram (4 leads); (3) X-ray and fluoroscopy of the chest; (4) hemoglobin estimation; (5) serum cholesterol determination; (6) urinalysis; (7) estimation of peripheral circulatory impairment by reactive hyperemia; (8) pulse wave velocity (an index of the elasticity of the general arterial tree); (9) studies on the response of blood pressure to light exercise, to cold (cold pressor test) and to 6 per cent carbondioxide inhalation; (10) estimation of the fat content of the body by the densitometric method; (11) an-

thropometric measurements of skeletal size and of skin fold thickness in standard locations; (12) personality evaluation (Minnesota Multiphasic test); (13) activity and dietary history.

It is planned to administer this battery of tests once a year to the volunteers for five consecutive years. After this time, status of these men will be checked by the usual follow-up methods for an additional five years. At this time an effort will be made to have all the available men undergo a physical examination to obtain their status in terms of current medical practice. It is expected that it will be possible to correlate the several biochemical, physiological and psychological measurements and the relevant items in the activity and dietary history with the subsequent development of arteriosclerotic and hypertensive cardiovascular disease in these men. It is hoped that from this work it will prove possible to identify the persons who are more than usually likely to have trouble in this respect, to discover factors in the mode of life which are predisposing and to provide indications for a preventive hygiene.

In addition to the long range studies described above a large number of experimental studies on other subjects and patients will be made to develop methods, test hypotheses and to provide validating criteria. Current activities in this part of the program include systematic researches on reactive hyperemia, on cholesterol metabolism, on the estimation of body volume, on renal blood flow in rest and work, on personality and emotion in relation to circulatory function with special emphasis on vasomotor instability and on exercise in hypertensive patients.

This program is being operated by the Senior Staff of the Laboratory of Physiological Hygiene: Drs. Ernst Simonson, Olaf Mickelsen, Austin Henschel, Henry Longstreet Taylor, Josef Brozek and Carleton Chapman and the Director, Dr. Ancel Keys. Part time associates in this program include representatives from the Departments of Medicine and Neuropsychiatry. The organization of the operating personnel in this project is based on the concept of interdisciplinary research. The team which is operating this program brings to bear on this major problem the skills and knowledge derived from the following disciplines: biochemistry, physiology, psychology, medicine and psychiatry. It is felt that only through the co-ordinated efforts of a number of specialists can a well-rounded solution of such a complex problem be achieved.

Every effort is being made by the investigators to work with the members of the local medical profession. There is no intent on the part of the Staff of providing medical care or advice to any of the men participating. In each case, the physician is notified that his patient has volunteered for this experimental program. It is emphasized to the participants that this data is being collected for scientific purposes only. If any abnormalities are found, the information is transmitted to the personal physician of the participant and the participant is told to consult his physician for advice and treatment. All findings and data are available to the personal physicians of the subjects.

HENRY L. TAYLOR, M.D.

MINNEAPOLIS HEALTH STATISTICS

A new all time high for births occurring in Minneapolis was set in 1947 with a total of 17,549. Dr. F. J. Hill, Commissioner of Health, reported today. The next highest record was in 1946 with 15,682 births. The total for 1947 includes 4,928 babies born to non-resident mothers compared with 4,169 in 1946. Though the monthly reports of births started a downward trend last August, the total for the year remained the highest on record. Boys continue to arrive more often than girls. In 1947 there were 855 more boys than girls born.

Even with over 17,000 babies being born during 1947, the city experienced outstanding low rates for infant mortality and deaths of mothers in childbirth with 25.7 per 1,000 live births and 0.5 respectively compared to 26.6 and 0.7 in 1946. "These are signs of good community health" stated Dr. Hill. Prematurity is the leading cause of death of infants under the age of one year, and particularly in the first month of life.

Deaths from all causes among residents increased slightly, being 4,657 in 1947 as compared to 4,473 in 1946. The over-all death rate was 9.1 per 1,000 population compared to 8.8 in 1946.

The preliminary figures show no change in ranking of the ten leading causes of death as compared to 1946 with the exception of tuberculosis and nephritis which exchanged positions, namely 9th place for tuberculosis and 10th for nephritis. Heart disease, cancer, apoplexy, diabetes, and nephritis continue to account largely for increase in the total number of deaths from all causes during the year. With the percentage of our population over 45 years of age increasing annually, we anticipate a higher death rate from degenerative diseases.

The incidence of certain communicable diseases increased in 1947, but there were no major epidemics as in 1946 with poliomyelitis. Whooping cough with 534 cases resulted in one death compared to 52 cases and no deaths in 1946; measles with 2,107 cases with one resident death compared to 410 cases and no deaths in 1946.

Considerable progress was made in diphtheria control during the past year with a reduction in deaths from 7 to 1 in 1946 and 1947, respectively. The drop from 110 cases of diphtheria to 58 was also noteworthy but still unenviable since the disease has been even more successfully controlled in other communities. Investigation of cases reveal that preventive "shots" had not been arranged for by parents.

As predicted during the polio epidemic in 1946 that there would be few cases in 1947, we had only 21 resident cases and 3 deaths in 1947 as compared to 763 resident cases and 47 deaths in 1946.

The increase in the number of reported cases of tuberculosis is largely attributed to an outgrowth of the Community-wide Chest X-ray Survey. The 1,022 reported cases of tuberculosis in 1947 as compared to 615 in 1946 reflects this intensified case-finding program. The increase in the tuberculosis death rate from 18.3 per 100,000 population to 20.5 in 1947 cannot be explained without a study of many factors. Because of the intensified case-finding program and the number of sus-

(Continued on Page 188)

MEDICAL ECONOMICS

Edited by the Committee on Medical Economics
of the
Minnesota State Medical Association
George Earl, M.D., Chairman

MEDICINE'S RECORD IS ANSWER TO TRUMAN PLEA

When, as was expected, President Truman's State-of-the-Union address to Congress on January 7 contained another plea that something be done to fill the "gap in our social security structure" created by the "lack of provision for the nation's health," the medical profession already had an answer—one recorded not in words but in positive action.

This answer was reviewed by the House of Delegates at the Cleveland interim session in January. It consists of a detailed progress report, prepared by the Board of Trustees of the American Medical Association, on what has been done toward achieving the objectives of the Association's ten-point national health program. The simple and unmistakable conclusion from the report is this—a lot has been done!

Briefly, the major accomplishments of the medical profession have been along the lines of extension of prepayment programs, both medical and hospital; continual advancement of scientific research; intensive public health education; support for needed and well-founded health legislation; and co-operation with responsible groups in an all-out effort to extend high quality medical and health care to all people.

Again Demands National Program

Recognizing that American medical standards are high, President Truman repeated the oft-heard contention that "most of our people cannot afford to pay for the care they need."

"I have often and strongly urged that this condition demands a national health program," said Mr. Truman. "The heart of the program must be a national system of payment for medical care based on well-tried insurance principles. This great nation cannot afford to allow its citizens to suffer needlessly from the lack of proper medical care." Conspicuously absent from the presidential

message was the word "compulsory." However, there is not the slightest evidence that Mr. Truman has changed his mind on compulsory sickness insurance, federally administered, as his solution to national health problems. At any rate, compulsion is not consistent with the American ideals of freedom which Mr. Truman says he wishes to see maintained. The medical needs of the American people are far more effectively met on a local community and state basis rather than by a system centrally controlled. The ideals of freedom are better protected on that basis also.

One in Three Now Protected

Mr. Truman neglected to mention that many millions of Americans are already protected against the costs of hospitalization and sickness by the Blue Cross Plans, the physician-sponsored voluntary plans for paying the costs of medical care and the contracts sold by long-established private insurance companies. Already the American people are well on the way toward meeting the President's standard of "a national system of payment for medical care based on well-tried insurance principles."

As of December, 1947, the latest date for which there are figures, about *one American in every three* had some form of insurance against sickness costs. A study conducted by the National Industrial Conference Board has revealed that at the end of 1947 total enrollments in voluntary plans—commercial and physician-sponsored, group and individual—topped the 61 million mark. Some duplication exists, the study showed, as for example the medical plans often require subscribers to purchase Blue Cross contracts along with medical coverage; but the above figure was reached with a liberal allowance for such overlapping. It was the conclusion of the Conference Board that so much attention has been diverted to socialized medicine that the phenomenal expansion of voluntary health protection has been overlooked. President Truman might well take note

that his request for "some kind of national health program" is already being filled—the voluntary way.

Welfare Department Idea Reappears

The idea of having a new department in the federal government to look after the welfare of the population cropped up again in the President's address. Physicians will recall that last February the Taft-Fulbright bill (S.141) to create a Department of Health, Education and Security was introduced in the Senate. This bill outlined the very thing President Truman had reference to when he said: "The government's program for health, education and security are of such great importance to our Democracy that we should now establish an executive department for their administration."

The plan to set up such a department did not fare too well in the last Congress, however; and what the President's chances are of seeing his present request filled during the coming year is not known.

S.141, advocating the three-cornered departmentment, was referred to the Senate Committee on Expenditures in the Executive Departments, where it languished for over a month. Opposition was expressed by the American Medical and Dental Associations and other organizations; hearings were concluded with the bill failing to be reported out of Committee.

Object to Third Party

The medical profession's objection to a Health, Education and Security Department stems from its creation of a third party between the medical profession and the President. The plan would create a Secretary of Health, Education and Security, under whom there would be three undersecretaries, one for each of the three major divisions. The handicaps under which an Under-Secretary of Health would have to operate are obvious. For example, he could get no action directly from the Chief Executive; he would have to discuss health and medical programs, legislation and policy with the President through an intermediary—someone, perhaps, from the welfare or social insurance fields.

For many years the medical profession has favored assembling and co-ordinating all health functions of our national government in a single agency with an administrative head in the Presi-

dential cabinet. The profession does *not* favor combining health, education and security in one department if it means subordinating health matters and forcing medicine to play a subsidiary role. If health is, as many statesmen have declared, a primary consideration of government, then it should warrant a separate department with the distinction of cabinet rank for its chief.

AMA Working to Obtain Objectives

The genuine effort of the American Medical Association to "get its ten-point program off the printed page and into actual practice," as it was outlined to the House of Delegates at Cleveland, stands as the best possible refutation of the claims made by Mr. Truman and others which create the impression that America is in dire straits, medically speaking.

The ten-point program of the AMA is a restatement of a fourteen-point program officially adopted in June, 1945. It has been offered as organized medicine's solution to the national health problem; in it the basic health needs of this nation are clearly outlined and the methods whereby these needs may be met are advanced.

Diametrically opposed to regimentation or any form of totalitarianism, the medical profession suggests the following as fundamental to good health: (1) minimum standards of nutrition, housing, clothing and recreation; (2) provision of preventive medical services through professionally competent health departments; (3) availability of procedures established by modern medicine for advice to the prospective mother and adequate care in childbirth; (4) proper attention including scientific nutrition, immunization and other services included in infant welfare for all children; (5) provision of health and diagnostic centers and hospitals necessary to community needs; (6) establishment of voluntary non-profit, prepayment plans for meeting costs of hospitalization and medical care; (7) high-type medical care for all veterans, preferably by a physician of their own choice, with payment by the government in cases where disabilities are service-connected; (8) research for advancement of medical science with endorsement of a National Science Foundation; (9) encouragement of participation in national health program of volunteer philanthropic health agencies; and (10) promotion of public health by widespread education and dissemination of information regarding prevention of disease and its proper treatment.

Pioneers in Health Education

In implementing the ten-point program, the American Medical Association has literally spared no efforts. For example, a look at the health education program which it carries on will bear this out. A pioneer in the field of public health education, the AMA is continually expanding and augmenting its program and utilizing all communication media—radio, newspapers, magazines, the speakers' platform, pamphlets, books, motion pictures, personal correspondence—and lately, television.

In addition the Association sponsors conferences, lends its personnel and members to other agencies and organizations as consultants or advisors or committee members, provides scientific exhibits for organizations requesting them. At present the AMA is actively co-operating with over thirty national agencies and organizations and its members serve on some twelve national committees. The AMA publishes articles on health and fitness in ten periodicals, including its own publication, *Hygeia*; answers an average of 2,500 letters a year on health problems; and issues health releases to about 2,000 periodicals and newspapers. Literally millions of books and pamphlets on health have been published by the AMA. Extension of education in health to schools in every grade and recognition of health education as a subject to be assigned for credit has also been urged.

A special campaign waged by the AMA has been its constant emphasis on the importance of the periodic health examination. It publishes a standard manual in this field and furnishes examination blanks; it employs every editorial channel available to promote recognition of the value of the periodic physical to preventive medicine.

Conducts Surveys, Promotes Research

Two other activities which medicine has undertaken and which are yielding results are the many surveys which are financed by AMA funds and the scientific research programs which it encourages and frequently sponsors.

One important survey to which the AMA is lending constant support is the hospital survey provided for in the Hill-Burton Hospital Survey and Construction Act. The AMA has directly sponsored several surveys in order to promote the extension of medical care in rural communities. With the co-operation of state and county medi-

cal societies it has surveyed the medical facilities and medical personnel in every county in the United States and has made the information obtained available to all medical schools and to all hospitals approved for internships and residencies for the purpose of helping young physicians choose locations for practice.

A study of medical schools in 1947 revealed that many have preceptorships with rural physicians for medical students in their senior year, scholarships for students who will practice in rural areas and many other plans for interesting younger men in rural practice.

An interesting two-part study on the utilization of medical facilities and personnel during an emergency was recently carried out. Phase One investigated medical services on the home front. Questionnaires were sent to physicians who remained home during the war. (While sixty per cent of practicing physicians carried 91 per cent of the pre-war patient load, it was found that 1942, the first year of heavy inductions, was the healthiest in U.S. history, up to that time.) Results of the study will be used to determine how even better results may be obtained in the event of another national emergency. The second phase of the survey was conducted among the returned medical officers to determine how medical personnel was utilized by the armed services. The study summarizes opinions and constructive criticisms made by the nation's wartime medical officers. Results will be of value to the Department of National Defense in planning medical policies for future use in the entire national defense establishment in peace and in war.

Other surveys undertaken by the AMA include one on the cost of medical care, one on the distribution of physicians and supply of medical services and one on the implications of group practice.

AMA Has Testing Laboratory

One of the important services which the AMA performs for the direct benefit of the public and for which it is well known is the examination of foods, drugs and various other products and devices. It maintains a laboratory to test preparations submitted for consideration and places its famous seal of approval on those which meet its rigid standards.

Not only does the AMA carry out such tests but it also is concerned with the development of

new tests and standards by which products can be identified and controlled. Practically everything which the AMA does encourages research or the use of knowledge gained from research. Through its scientific publications the results of research are published. Current research projects are listed periodically in the *Quarterly Cumulative Index Medicus*, put out by the AMA. The Association has created three special committees which have medical research functions. One attempts to co-ordinate and arrange research projects and the others make available funds for research purposes. In 1947 the AMA established a trust fund of \$1,500,000, the interest from which will be used each year to support medical research. In all of its activities, the AMA works to advance the health standards in this country. It is in the hope that American Medicine will always maintain its enviable record that the medical profession through its national organization guards jealously our system of freedom of enterprise, which is the only system under which medicine can hope to exist or advance.

COUNCIL APPOINTS COMMITTEE TO REVISE MSMA CONSTITUTION

At its December meeting, the Council of the Minnesota State Medical Association appointed a four-man committee to undertake a study of the Association's Constitution and By-Laws.

The old Constitution, adopted by the House of Delegates in 1937, is still basically sound; it lays down a set of fundamental principles which embody the ideals of medicine and medical organization. However, it has been brought to the Council's attention that certain difficulties and inconsistencies have been encountered which indicate that the Association has outgrown some of the methods employed in medical organization at the time the Constitution was first drafted. Therefore, it was decided that a careful examination should be made of the present framework to determine what practices are now outmoded and to decide where revisions should be made.

Appointed to undertake the project are Dr. O. J. Campbell, Minneapolis, who will serve as the chairman of the committee, Drs. C. B. Drake and B. B. Souster, St. Paul, with Mr. F. Manley Brist, Association attorney, as legal counsel. The group will study the present Constitution and By-Laws thoroughly, formulate the needed revisions and submit them to the House of Delegates for final approval.

MINNESOTA STATE BOARD OF MEDICAL EXAMINERS

230 Lowry Medical Arts Building
Saint Paul, Minnesota

Julian F. DuBois, M.D., Secretary

Minneapolis Man and Woman Sentenced for Criminal Abortion

Re. State of Minnesota vs. Vern E. Jorgensen and Lillian Mullane.

On February 5, 1948, Vern E. Jorgensen, thirty-five years of age, 4036 Zenith Avenue North, Minneapolis, and Mrs. Lillian Mullane, fifty years of age, 4407 Portland Avenue, Minneapolis, were sentenced by the Hon. Frank E. Reed, judge of the District Court of Hennepin County, following their respective pleas of guilty on November 10, 1947, to an information charging them, jointly, with the crime of abortion. Jorgensen was sentenced to a term of not to exceed four years in the State Prison at Stillwater, the sentence being stayed and the defendant placed on probation for a period of five years. Mrs. Mullane was sentenced to a term of two to eight years in the Women's Reformatory at Shakopee, the sentence being stayed and the defendant placed on probation for five years, provided, however, that Mrs. Mullane must serve the first year of her sentence in the Minneapolis Women's Detention Home. Mrs. Mullane's sentence was doubled because of the fact that on October 8, 1924, she was convicted of grand larceny in the second degree in the District Court of McLeod County, Minnesota.

The defendant Jorgensen, who posed for several months in Minneapolis as "Dr. Vern Roberts," and the defendant Mullane, were arrested on a complaint issued October 18, 1947, in the Municipal Court of Minneapolis charging both, jointly, with performing a criminal abortion on a thirty-five-year-old married woman. The abortion was done by the defendant Jorgensen at the home of the defendant Mullane by means of a catheter. Jorgensen was paid \$160 for his services. Jorgensen admitted that he had been posing as a doctor and that he had performed approximately 100 criminal abortions during the past three or four years. Jorgensen is a son of Mrs. Anna D. Huff, who on May 17, 1943, entered a plea of guilty in the District Court of Ramsey County to an information charging her with the crime of manslaughter following a criminal abortion. For that crime Mrs. Huff was sentenced to a term of five years in the Women's Reformatory at Shakopee, which sentence she served. The defendant Mullane has a long criminal record consisting of five convictions for shoplifting in Minneapolis and St. Paul. She also has two previous convictions for the illegal sale and possession of liquor, one in 1926 and one in 1929, in addition to the larceny conviction in the District Court of McLeod County.

The Minnesota State Board of Medical Examiners wishes to acknowledge the very fine co-operation received from the Minneapolis Police Department in the investigation of this case and from the Hennepin County Attorney's office in the presentation of the matter in Court. The Medical Board also believes that the sentence imposed by Judge Reed will convince the defendant Mullane that she cannot shift her operations from shoplifting to being an accomplice of an abortionist. Judge Reed warned the defendant Jorgensen that he was receiving probation because he did not have a previous conviction for a felony and that if any complaint is made about his activities during the next four years, and the facts support the complaint, Jorgensen would be taken to Stillwater to serve his entire sentence.

Minnesota Academy of Medicine

Meeting of October 8, 1947

The regular monthly meeting of the Minnesota Academy of Medicine was held at the Town and Country Club on Wednesday evening, October 8, 1947. Dinner was served at 7:00 o'clock, and the meeting was called to order at 8:00 p.m. by the president, Dr. E. M. Hammes.

There were fifty-five members present.

Dr. Carl B. Drake read the following memorial to Dr. William Davis, and a motion was carried that it be placed on the records of the Academy and a copy sent to the family of Dr. Davis.

WILLIAM DAVIS, 1853-1947

Dr. William Davis, the last surviving charter member of the Minnesota Academy of Medicine, passed away on May 9, 1947, at the age of ninety-three. He had practiced fifty-six years before his retirement on April 30, 1939.

Dr. Davis was born in Plymouth, Massachusetts, September 28, 1853, the ninth lineal descendant of his Pilgrim ancestors to be born in that historic town. He attended Phillips Exeter Academy before receiving his B.A. degree from Harvard College in 1876 and his M.D. from Harvard Medical School in 1879. He served a three months' internship at the McLean Lying-In Hospital in Boston and spent a year in Vienna in post-graduate study.

After practicing in Syracuse, New York, for three years, Dr. Davis moved to Saint Paul in 1883, the same year joining the Ramsey County Medical Society. He was president of his county society in 1892, president of the Minnesota State Medical Association in 1901, and a member of the Minnesota State Board of Medical Examiners from 1900 until 1906.

Dr. Davis was interested in early medical publications, having been editor of the *Northwestern Lancet* from October, 1886, until December, 1899, and on the Editing and Publishing Committee of the *Saint Paul Medical Journal* from 1901 until 1912.

The Minnesota Academy of Medicine was founded October 12, 1887. Dr. Davis' first paper before the Academy was on October 9, 1894, on the subject of "Movable Kidney." This was published in the *Northwestern Lancet* (vol. 14, p. 478). He was elected president of the Academy on October 7, 1903, and gave his presidential address the following month (as was then the custom) at the meeting of November 4, 1903, on "Unusual Sources of Poisoning." This contribution was published in the *Saint Paul Medical Journal* in 1904 (vol. 6, p. 34).

At the meeting of February 10, 1932, Dr. Davis presented to the Academy the original copy of the minutes of the first meeting of the Academy which were decorated with original drawings by Dr. E. C. Spencer of Saint Paul, who was then secretary, and the page was bound in the Proceedings of the Academy for that year.

Dr. Davis married Sally White Holyoke on June 26, 1878. They celebrated their golden wedding in 1928 at their summer home at South Orleans, Massachusetts, surrounded by family and friends. Mrs. Davis died in 1929. He is survived by four children, fourteen grandchildren and twenty-two great grandchildren, one grandson having been killed in World War II.

Dr. Davis built a summer home at South Orleans in 1907 and spent his summers there yearly until 1942. His summer home proved a Mecca for friends visiting in the East and was continuously filled with members of his family.

He was a member of Unity Church in Saint Paul and for many years belonged to the Informal Club. He was fond of bridge and played a keen game until he was invalidated as a result of a fractured hip in November, 1945.

Dr. Davis was an esteemed member of the medical profession and of the Minnesota Academy of Medicine. His was a life rich in service and friends.

The scientific program followed.

Dr. Stanley Maxeiner, Minneapolis, read his inaugural thesis which follows. Colored motion pictures were shown.

THE TOURNIQUET AMPUTATION

STANLEY R. MAXEINER, M.D., F.A.C.S.

Clinical Associate Professor of Surgery, University of Minnesota

Minneapolis, Minnesota

Tourniquets have been applied for centuries for the control of hemorrhage. Heliiodorus,³ in the second century A.D., referred to its use in the control of bleeding during amputation of the extremities, and many types of tourniquets have since been devised to suit the purpose for which they were intended. In all of these applications, compression was used for the sole purpose of controlling bleeding until surgery could be instituted, either by ligation or amputation. We have found no record in the literature previous to 1924 of case reports in which the tourniquet was applied for the purpose of limiting infection. At that time R. E. Farr,² with whom I was associated, reported three cases before the Minnesota Academy of Medicine. One case of gas gangrene of his own and one of the writer's, so treated, survived almost overwhelming infection. The third patient, also similarly treated for virulent infection superimposed upon arteriosclerotic gangrene in the presence of cardiac decompensation, expired from cerebral thrombosis after five days. The extremities were wrapped in

Inaugural thesis.

formaldehyde solution distal to the tourniquet and encased in a rubber envelope.

We have now treated more than twenty patients by this method, which we have modified and improved from time to time. The first decision, and perhaps the most important one to be made, is that the damage to the extremity is irreparable and that it must be sacrificed. Secondly, in the very bad-risk patient in whom a primary classical amputation would probably be fatal, the tourniquet is applied as an expedient in the hope of saving life. Later, the second stage may be completed either according to our technique or, when the general condition of the patient will permit, by performing a classical amputation.

In 1924 the author started using as a tourniquet about 5 feet of one-half inch pure gum rubber tubing, which is stretched very tightly and remains tight as it cuts deeply into the tissues. Pain is usually minimal, as the pressure from the rubber tubing produces anesthesia of such degree that only moderate sedation is required.

Much has been written in recent years about refrigeration for anesthesia and for the preservation of tissue of impaired vitality. Refrigeration has been used with and without the tourniquet, but we have continued to use formaldehyde solution because of the simplicity of its use and the fact that when the part is encased in rubber the process is odorless. We have repeatedly cared for patients so treated in large wards. Recently we used our technique in a Sisters' hospital where the leg had been treated for days by refrigeration. The contrast was convincing when they no longer had to carry pails of ice and water.

The writer served in the armed forces in the first World War and is convinced that many lives could have been saved by the sacrifice of an extremity by the tourniquet technique. We have so treated several patients whose extremities, one or more, had been traumatized so severely that amputation was inevitable. It is truly amazing to observe the minimal systemic reaction, the absence of shock, and often the almost immediate improvement following the institution of this procedure. In 1941 I published an article on, "The Temporary Tourniquet Amputation"⁴ in which I stated, "During a recent trip south I saw an article in the San Antonio paper to the effect that an airplane pilot had crashed and sustained such a mutilating injury to both legs that double amputation was necessary. The article further stated that the pilot promptly died following the shock of the accident and the operation." We firmly believe that in war or peace, and especially in industrial and traffic accidents, the tourniquet technique affords a temporary expedient, a procedure of minimal severity, at a time when definitive surgery would be hazardous. The tourniquet may be left on for days, and the rubber tubing will complete a guillotine operation without shock, or a secondary elective operation may be performed at an optimum time. Major Paul Adolph,¹ in an article entitled, "Preoperative Measures Used in War Surgery in China: With Special Reference to the Delimiting Tourniquet," states that they used the tourniquet to obtain preoperative improvement before amputation, in the severely toxic patient

who may have been lying out on the battlefield for two to three days. The lives of Chinese soldiers, whose extremities were badly mutilated and infected, were saved when the delimiting tourniquet was employed.

Indications

There must be the necessity for an amputation as a life-saving procedure in the presence of forbidding surgical risk. These indications exist in the presence of (1) severe trauma with irreparable damage to an extremity of a patient who is suffering severe shock from the loss of blood or the magnitude of his injuries, (2) virulent infections, especially gas gangrene, and (3) gangrene due to diseased peripheral circulation with superimposed infection or concomitant diabetes or critical heart disease.

Necessary Equipment

Pure gum rubber tubing, five feet.
White cotton, sterile, one roll.
Dental rubber dam, sterile.
New rubber draw sheet, one.
Formaldehyde solution, 10 per cent, one gallon.
Roller bandage, 4-inch, one.

Technique

The procedure may be employed either in the operating room or in the patient's bed. The latter has been found to be a decided advantage in critically ill patients with gangrene complicating diabetes or heart disease. We have repeatedly found intravenous morphine or intravenous morphine and scopolamine to furnish adequate anesthesia. Likewise, pentothal sodium has been very satisfactory.

The skin of the extremity is first painted with antiseptic solution several inches above and below the site of application of the tourniquet. The dental rubber dam or a strip of pure gum rubber, 6 to 8 inches wide and long enough to encircle the extremity and overlap a few inches, is placed so that its lower border is at the site of amputation. Next, the rubber tubing is tightly stretched and wrapped about the site of amputation just including the lower border of the rubber dam. Each turn of the tubing overlaps the one below so that the constricted area is as narrow as possible. The ends of the tubing are secured by taping together firmly so that they cannot possibly slip. The extremity distal to the tourniquet is next wrapped with a goodly quantity of white cotton. It is well to use the cotton in abundance. The new rubber draw sheet is next applied so that the extremity may be securely enclosed. The cotton is next saturated with about two quarts of formaldehyde solution, and the closure in the rubber sheet is completed and held fast with the 4-inch bandage. The rubber dam is next turned distally, sealing the upper opening of the wrapped sheet, and held securely by a few laps of the bandage. By this means, the extremity below the tourniquet is preserved in a laboratory solution which renders the gangrenous part odorless, nor is there any odor from the formaldehyde. We have repeatedly cared for these patients in wards without complaint.

Postoperative Care

General supportive treatment may be carried out as usual. Transfusions and infusions may be used as desired, and likewise, antibiotics if indicated. There is no interference with the routine treatment for the patient's shock, his diabetes or his heart disease. Mild sedation is usually adequate since, in only a few hours, the gradual compression of the tourniquet produces pressure anesthesia. This feature has almost been the rule although one or two patients have required greater amounts of sedation.

Usually once daily the rubber envelope is opened slightly and one to two pints of formaldehyde added to assure against odor from the gangrenous part.

Secondary Procedures

After the tourniquet has been applied and supportive treatment instituted, the condition of the patient may improve to such a degree that the surgical risk is lessened. Two alternatives present:

1. A classical amputation may be done, with flaps fashioned above the tourniquet. This is particularly applicable to crushing injuries not accompanied by severe debilitating disease. Naturally, it is the more rapid and the more ideal method of producing a definitive stump in selected cases.

2. The continued action of the elastic rubber tubing for eight to ten days will compress a groove through all the soft tissues to the bone. There remains only a hard dry cuff over the bone, completely free of sensation. As a result, a Gigli wire saw may be placed in this groove immediately above the tourniquet and the remaining tissue and bone cut across without anesthesia. The result is a guillotine operation. Usually the skin edge and layer of muscle eventually separate due to the crushing. Occasionally, at this time we divide the bone several inches higher under local anesthesia and use adhesive traction to pull the soft tissues together. One may choose, however, to dress the stump aseptically and, at a later date, perform a plastic operation, removing adequate amounts of bone and muscle to permit the skin edges to be approximated loosely by through-and-through sutures. Though more time consuming, this latter procedure will permit the saving of life in a larger number of amputations complicated by sepsis and severe debilitating disease.

Mortality

This procedure is an expedient made available to the critically ill patient in whom the classical operation of choice would be too hazardous. The application of the tourniquet and dressings produce no shock. In no patient have we observed any direct adverse symptoms. No deaths, I believe, can be attributed directly to the procedure when followed as described. One death occurred during anesthesia for severing of the painless compressed bed of the tourniquet. Most deaths have been due to the debilitating disease from which the patient suffered. Some who survived are, we believe, definite salvage attributable to the method.

Early in our experience we always had another tourni-

quet ready for possible secondary hemorrhage, but none has ever occurred.

Statistics of the twenty cases reported indicate there have been six deaths, or a mortality of 30 per cent, and, as stated, none of them can be attributed to the method.

Case Reports

Cases 1 and 2 are briefs of two case reports by Dr. R. E. Farr before the Minnesota Academy of Medicine February 13, 1924, and published in the *Annals of Surgery*, 79:913-916, 1924.

Case 1.—Robert, aged sixteen, had his left arm run over by a truck on March 19, 1923. Two days later he was referred to Dr. R. E. Farr by Dr. E. S. Geist. The boy was in critical condition, with his temperature 102° and pulse 120. Hemoglobin was 28 per cent. He had a gas gangrene involving his whole arm and shoulder. Multiple incisions were made over the shoulder and a tourniquet applied to the arm. The patient recovered.

Case 2.—Mrs. S. K. was seen by Dr. Farr on June 6, 1923. She had had a cerebral accident and developed gangrene of the left lower extremity. Palliative treatment was of no avail, and a tourniquet was applied. Five days later the amputation was completed. Six days later the patient succumbed to a terminal cerebral accident.

Case 3.—A young male adult, while reaching across a circle saw, severed most of the tissues just distal to the axilla. When seen at the end of forty-eight hours he was in extremely critical condition; his temperature was 102°, his pulse 120, and practically the entire arm below the injury was infected with gas bacillus. The skin was dark, there were no pulsations and no sensation. The general condition of this patient was so critical that in the opinion of those who saw him, he would not stand a surgical amputation.

A tourniquet was placed as high up on the arm as possible and the distal arm wrapped in 10 per cent formaldehyde. Several areas over the shoulder which crepitated were incised and Dakin tubes were introduced. The patient soon began to improve, and his temperature and pulse fell to normal within a few days. One week after his entrance to the hospital, the condition of the patient was such that he was taken to the operating room, and it was found that the tourniquet had cut through all of the soft tissues and it was necessary for us to divide only the bone. At a subsequent date a plastic operation covered the denuded surfaces. The patient made an uneventful and rather rapid recovery.

Case 4.—Mr. E. E., aged fifty, fell head foremost beneath a train, and the wheels severed both arms at the elbow joints. When first seen by us, the patient was almost moribund with a blood pressure of 0/0. He was treated with oxygen, transfusion, stimulants, et cetera, and at the end of three and one-half hours his condition permitted a temporary surgical amputation of the right arm. He was given prophylactic tetanus and gas bacillus antitoxin. A tourniquet was wrapped around the left arm at the lowest point of viable tissue. Forty-eight hours later he had a rapid rise in temperature, a chill, and gas bacillus infection was found in the left arm above the tourniquet. The patient was again returned to the operating room and the left arm amputated surgically. Dakin tubes were introduced for his gas bacillus infection. Subsequent plastic operations were necessary on both arms, but he made a very satisfactory recovery.

At the time of the accident the patient survived one amputation with difficulty. The tourniquet permitted us

to delay operation on the other arm until his general condition permitted. Gas bacillus infection in the left arm certainly would not have occurred if, in our eagerness to conserve all possible tissue, we had not placed our tourniquet too low. During the second operation it was quite obvious that hemorrhage, muscle laceration, et cetera, had occurred proximal to the site of the tourniquet.

Case 5.—A male adult, aged seventy-eight, was struck by a truck, sustaining compound, comminuted fractures of the tibia and fibula and severance of the soft tissues of the calf of the leg, including the vessels, nerves and muscles. There was no sensation and no pulsation below the knee. The patient was taken to the General Hospital in severe shock where he was treated in the emergency room and given 750 c.c. of blood. He was subsequently moved to a private hospital where he entered our care. He was still in shock. His systolic blood pressure ranged from 80 to 90 but his skin was cold and his general condition was poor.

The original tourniquet was removed and an elastic rubber tube tourniquet wrapped about the leg at the level of the knee. The leg below the tourniquet was wrapped in 10 per cent formaldehyde and encased in a rubber sheet. The patient was given an additional 600 c.c. of blood, but his general condition was bad. Part of the time he could not be aroused and we felt that amputation at that time was definitely contraindicated. At the end of twenty-four hours his condition was greatly improved. His blood pressure was 140/70. The next day he was taken to the operating room, and under local anesthesia a mid-thigh amputation was performed. He was subsequently given several transfusions and other supportive treatment.

The patient had a rather stormy convalescence, but we were fortunate to have primary healing of his flaps. On the sixteenth postoperative day the patient developed bronchopneumonia from which he recovered, and he was discharged from the hospital on the twenty-sixth day with the flaps completely healed.

Case 6.—Mrs. S. H., aged fifty-eight, who was referred to us through the courtesy of Dr. W. K. Foster, had been a victim of arthritis and heart disease for a long period of time. On February 27, 1941, when seen by Dr. Foster, the patient gave a history of very severe pain in the left leg six days previously and a second attack with violently severe pain in the right leg three days previously.

On examination the popliteal vessels were found to be completely occluded with a beginning gangrene of the left foot and left leg. The right leg had undoubtedly started as a popliteal occlusion, but the thrombus had formed until it had occluded the deep femoral vessel, and gangrene had already extended well up onto the thigh. The patient was in extremely critical condition, with decompensation and auricular fibrillation and at times delirium.

She was treated medically for several days and was presented clinically to the Surgical Section of the American College of Surgeons meeting in Minneapolis as a problem case. We all agreed that inasmuch as the patient was improving and both legs were undergoing a dry gangrene, it was better to let the patient alone. However, a few days later she became progressively more toxic with elevation of temperature, and it was quite obvious that the right leg was the cause of her relapse. A piece of gum rubber tubing was wrapped tightly around the thigh at the lowest point at which the amputation might be considered successful. The distal leg was wrapped in formaldehyde dressings covered with rubber sheeting. At the end of nineteen days the patient was very greatly improved. The tourniquet had cut through all of the soft tissues and the bone was severed. The patient's condition improved materially during the time that the tourniquet was cutting through

the thigh, and after the amputation, her temperature returned nearly to normal and her pulse and heart action were greatly improved. Surgical amputation on this patient at any time since we first saw her would have been fatal. However, she stood the tourniquet amputation without any apparent ill effect on her already critical condition. A tourniquet amputation of the other leg was contemplated.

In this case, because of the high thigh amputation and the possibility of secondary hemorrhage from the femoral artery, a sterile tray with Kirschner wires and tourniquet was maintained in constant readiness in the patient's room. The Kirschner wires naturally were to keep the tourniquet from slipping off when applied in such a high position.

NOTE: After publication of the preceding report, the patient's other leg was treated by the tourniquet method. On the sixth day, however, before the amputation was completed, she suddenly expired from a coronary occlusion.

Cases 3, 4, 5 and 6 have previously been reported.

Case 7.—Mrs. E. J., was seen in consultation with the late Dr. W. Moir. This patient, seventy-two years of age, entered Asbury Hospital on November 17, 1941. She had been a diabetic for years. For two months she had had a progressive gangrene of the left third and fourth toes. Blood sugar was 286 milligrams per cent.

On November 27, 1941, an amputation was done by Dr. Moir at the tarsometatarsal joints, removing the gangrenous area. Infection aggravated her condition, and her temperature rose to 103° on the third postoperative day. On the eleventh and twelfth postoperative days the patient was delirious. Temperature was 102° with very difficult control of sugar.

On the twelfth postoperative day a tourniquet was applied in the patient's bed and the leg wrapped in formaldehyde dressings. Twenty-four hours later her temperature was normal, she had lost her delirium, and the diabetes was more readily controlled.

Ten days after application of the tourniquet the leg was amputated. The bone was divided at a higher level and the skin edges loosely approximated. This patient recovered and returned home about three weeks later with the stump nearly healed.

Case 8.—Mr. K., aged sixty-eight, a married man, gave a long history of cardiac disease. His heart had been irregular for years. On February 18, 1944, he stated that he had had a mild stroke two years previously. During the past year he had been better and had worked daily. On the morning of February 18 when he got up, he began to have numbness in his right foot, then blanching and severe pain. He was hospitalized, and an iliac embolectomy was done by Dr. H. Hoffert and myself with complete recovery.

The patient developed the same symptoms, with pain, numbness and a cold right leg, on September 24, 1945. He was seen late by Dr. A. Cardle, who stated his heart was fibrillating and his condition was not good. When seen by me, he had a gangrene of his right leg. An electrocardiogram was reported to indicate the presence of (1) auricular flutter, (2) myocardial damage, (3) left axis deviation and (4) coronary disease.

On September 28, 1945, the patient's condition was not good, and he was complaining of very severe pain in his right leg. A rubber tourniquet was applied and the leg wrapped in formalin. During the next two days the patient had almost no reaction and required only two hypodermics for pain during the first twenty-four hours. Nine days postoperatively, his condition had improved to such a degree that he was taken to the operating room and the amputation was completed by Dr. Hoffert. The bone was divided at a higher level and adhesive traction brought the skin edges together. Thirteen days later he was discharged from the hospital with the

stump partially healed. He was subsequently fitted with an artificial limb.

Case 9.—Mrs. D., aged seventy-three, entered St. Mary's Hospital on September 14, 1943. The history and physical examination revealed hypertension, left heart failure and severe diabetes. She had a gangrenous left foot which produced a severely toxic effect. Her electrocardiogram was normal, but the x-ray revealed cardiac enlargement and pulmonary congestion. Sixty-five units of insulin failed to keep her urine sugar below 3 to 4 plus. She developed a severe infection, rapidly spreading into the gangrenous foot, and her temperature rose to 102° plus.

On September 21, 1943, a tourniquet was applied below the knee and the distal segment wrapped in formalin, encased in a rubber sheet. On September 22, 1943, twenty-four hours later, her temperature was normal, she had no shock or ill effect and almost no pain from the application of the tourniquet. Nine days later the amputation was completed with a Gigli saw without anesthesia. There was more slough at the end of the guillotine stump than usual and one week later, when the patient's condition permitted, she was taken to the operating room and, under local anesthesia, the bones were divided at a higher level and skin flaps fashioned and loosely approximated. The patient recovered slowly and returned home with the stump nearly healed.

Case 10.—Mrs. J., reported through the courtesy of Dr. L. K. Buzzelle, was an elderly lady who had a severe heart attack in California. Several weeks later she was removed from a train in Minneapolis and taken to Asbury Hospital in a semiconscious state. She developed an embolic gangrene of the left leg and was in very critical condition. Because of her severely toxic condition, amputation was advised, and because of her critical state, a tourniquet amputation was selected as the least hazardous.

A tourniquet was applied June 15, 1945, and the leg wrapped as usual. There was no shock or deleterious effect from the procedure and on the tenth postoperative day the amputation was completed. Traction was used on the skin of the stump. She weathered her operation without event but, five days later, had a hemiplegia from which she expired. Autopsy revealed coronary sclerosis, arteriosclerosis, hypertensive kidney disease, and the immediate cause of death to be cerebral hemorrhage.

Case 11.—Mrs. C. was seen in consultation with the late Dr. Salt.

This patient, forty-nine years of age, married, was seen by me when she was in a pitiful state. She had sustained a fracture of the right hip which was treated by open operation and mechanical fixation with evident success. Subsequently it became necessary to remove the screws, and the wound later became infected. She developed an osteomyelitis with destruction of the neck and upper shaft of the femur. When seen by me, the patient was a confirmed drug addict who cried out upon the slightest manipulation. Her leg was frail and turned if not supported. Nursing care was a problem as she ate little and had fallen away badly in weight. It was almost impossible to turn her or care for her.

Amputation was advised but none believed she could tolerate an operation of election. As a result, a tourniquet was applied under pentothal sodium at a level 3 inches below the greater tuberosity on March 20, 1945. She had a stormy time for several days, but sixteen days later, under the influence of morphine sulphate, the amputation was completed in the patient's bed. The leg healed slowly, and two months later she was discharged from the hospital. The stump was nearly healed, and she was no longer taking any drugs. She was eating well and had gained weight.

Case 12.—Mr. F., aged fifty-seven, a married man, stated that he had had diabetes for nine years which was controlled by diet. He had developed a sore on the outer side of his right foot three years previously which responded but little to treatment. Three weeks before he was seen, the foot became progressively worse with swelling and discoloration, and a moist gangrene involved the foot.

When seen by us, he had a swollen, moist gangrenous foot with streaks extending well up the leg. On January 13, 1946, his temperature was 101° and pulse 100. Urine revealed sugar, 4 plus; his blood sugar was 258 mg. per cent, and white blood count was 33,000. The next day his condition was worse, and his temperature rose to 102°. At that time the first stage of a tourniquet amputation was instituted. At the end of twenty-four hours his temperature was normal, pulse 75 to 80, and the sugar in his urine was 2 plus. He required only one hypodermic in the first twenty-four hours, and one daily controlled pain during the first few days.

Ten days later the patient's condition was excellent, and a Gritti-Stokes operation was performed. There was little reaction to either operation and the patient was discharged sixteen days later with primary healing.

Case 13.—Mr. J. McM., aged sixty-one, was admitted to the hospital quite toxic and incoherent. We obtained information that he had a painful foot for six weeks, but he continued to work on a farm. During the past week the middle toe of the right foot became black, and the pain was so great that he could not be up and about. When seen by me, he was very toxic, confused mentally and complained of intolerable pain in his foot and leg. He presented a swollen right leg with a typical picture of moist gangrene extending to just below the right knee. Cellulitis was starting up the thigh. His blood sugar was 188 mg. per cent but he had 3 plus sugar in his urine.

On December 31, 1947, the first stage of a mid-thigh tourniquet amputation was performed. He experienced no shock and no noticeable ill effect. His blood pressure remained 120/60 throughout. Six days later the amputation was completed without anesthesia and a sterile dressing applied over a guillotine stump. One week later when the patient was up in a wheel-chair he suddenly expired from coronary occlusion.

Case 14.—Mrs. K., a middle-aged woman who was in excellent condition, was skillfully operated upon by another surgeon for a fibromyoma of the uterus. Four days later she developed severe pain in her right leg with blanching, numbness, reduced temperature and an absent pulsation in the arteries of her foot. An embolectomy was done, but gangrene developed. Two days later a guillotine amputation was done 6 inches below the knee where the circulation seemed good. The stump became septic and the flaps sloughed. She had chills and severe reactions from all transfusions, and one month after the embolectomy she became delirious, with temperature to 103° and pulse 140. Her condition was so serious that she undoubtedly could not have stood a surgical mid-thigh amputation.

A rubber tube tourniquet was applied, and the temperature fell and delirium improved. However, she continued to have pain, and her condition remained poor, so that when her temperature again rose to 102° she was taken to the operating room and, under general anesthesia, a guillotine amputation completed. Although her convalescence was stormy and slow, she made a complete recovery. I believe in this instance the tourniquet delayed amputation and improved her general condition enough to permit a successful guillotine operation.

Case 15.—This patient, a man, aged seventy-five, entered the University of Minnesota Hospitals in very poor condition. He was completely studied, and unrelated

findings will not be reported. His hospital diagnoses were (1) diabetes, (2) arteriosclerosis, (3) coronary heart disease and (4) gangrene of left leg. The patient complained bitterly of pain in the gangrenous leg; his temperature was moderately elevated, and there was mild sepsis.

Morphine and scopolamine were given intravenously; a tourniquet was applied and the leg wrapped in formalin. There were no unusual reactions but the patient's temperature remained elevated and the x-ray suggested the possible cause to be pulmonary. During the completion of the second stage under anesthesia, the patient expired, the autopsy revealed as the immediate cause of death, acute pulmonary atelectasis.

NOTE: The reports of Cases 16 and 17 are through the courtesy of Dr. R. Pogue, Watertown, Minnesota.

Case 16.—This elderly, very frail woman, aged seventy-five, a severe diabetic, developed gangrene of her left foot. She suffered severely for a long time and was confined to her bed because her family objected to amputation. She became moderately septic, with sugar, 4 plus, in her urine, and was controlled with difficulty by insulin. I do not believe an elective mid-thigh amputation could have been done successfully on this poor-risk patient. As a result a tourniquet was applied; there was no reaction, and her insulin requirement dropped instantly. Ten days later her condition was greatly improved and the second stage was done under local anesthesia, dividing the bone at a higher level and bringing the skin loosely together. She had excellent healing and made a splendid recovery.

Case 17.—This patient, a man, sixty-eight years of age, in January, 1947, complained of severe pain in his left foot where he had developed two ulcers. The patient was a severe diabetic with 4-plus sugar in his urine, poorly controlled with large doses of insulin. The infection progressed, and his temperature rose to 102°. On February 20, 1947, a rubber tube tourniquet was applied 6 inches below the knee and the leg wrapped in a rubber pillow filled with chopped ice. Almost immediately his temperature returned to normal, and the insulin requirement was cut one-half. Eleven days later, after an intravenous dose of morphine, the leg was severed with a Gigli saw. Insulin was discontinued and the patient experienced an uneventful recovery.

Of unusual interest in this case was the fact that Dr. Pogue was away, and instructions were given over long distance telephone to his associate who had never seen the method employed.

Case 18.—Mr. L. B., seventy years of age, married, was a printer by trade. He entered the hospital because of unbearable pain in his left foot and leg. He stated that he had had repeated anginal attacks since 1942, and one and one-half years later suffered a right hemiplegia. His hospital diagnoses were (1) arteriosclerotic heart disease, severe, (2) thrombosis of left femoral artery, (3) dry gangrene of left heel and toes of left foot, and (4) hemiplegia, right, secondary to cerebral embolism.

On January 31, 1947, under morphine and scopolamine given intravenously, a rubber tube tourniquet was applied. His temperature remained elevated and he expired four days later. Autopsy revealed (1) bronchopneumonia, (2) coronary sclerosis, generalized, (3) arteriosclerosis, generalized.

Case 19.—(By courtesy of Dr. W. White) This man, aged seventy-eight, had suffered from (1) arteriosclerosis, generalized, and (2) coronary arteriosclerosis and senility. He developed an acute coronary occlusion and was bed-fast. He fell out of bed and injured his left leg, which was followed by numbness in the leg for

several days, when he developed an acute gangrene with very severe pain. It was because of the progressive condition of the disease and almost intolerable pain that amputation was advised.

A rubber tube tourniquet was applied just above the knee. Eight days later the amputation was completed. The patient lived five days longer and expired in a state of general exhaustion and loss of strength.

Case 20.—This is probably one of the outstanding cases of this series and proves the value of the method in trauma.

The patient, aged sixty-five, a merchant, was crossing the railway tracks to his place of business when he was hit by a locomotive engine. He was taken to the Minneapolis General Hospital in severe shock, where he was given 750 c.c. of pooled plasma. He was then transferred to Asbury Hospital where he entered our care. Examination revealed the following injuries:

1. Crushing of the right foot with extreme mutilation of the tarsal and metatarsal bones.
2. Dislocation with compounded injury of the left ankle.
3. Fracture of the right pubic ramus, of the right ilium and separation of the right sacroiliac.
4. Fracture of the neck of the left femur.
5. Fracture of the transverse processes of the third and fourth lumbar vertebrae.
6. Fracture of the fifth, sixth and seventh ribs on the left and the sixth and seventh ribs on the right side.

Plasma and blood transfusions were administered, together with other supportive measures, and, as soon as his condition would permit, a debridement of the left ankle was done. The ankle joint, which was widely open, was freely irrigated. The dislocation was reduced and the wound closed with only a small drain. To maintain reduction of the ankle and at the same time keep the fractured femoral neck from displacing, a Kirschner wire was passed through the left os calcis and traction applied. We were convinced that surgical amputation of the irreparable right leg might well result fatally in one so severely injured. We applied a rubber tube tourniquet about the junction of the lower and middle thirds of the calf and wrapped the distal portion in a formalin dressing in a rubber sheet.

The patient responded well to supportive treatment, and on the eighth day the leg was severed with a Gigli saw without anesthesia. Eleven days later he developed a severe thrombophlebitis involving the left leg. Ten days after the onset of the phlebitis, we did an open reduction of the left hip and anchored the fractured ends with three large screws.

One month after the injury, the left ankle was healed, the right hip had been secured by internal fixation, and the guillotine stump of the right leg was healing well. One hundred days after the administration of the pooled plasma, he developed acute infectious jaundice. The guillotine stump was eventually closed by a minor plastic operation under local anesthesia.

It is now one year since the accident; the patient is quite well and wears a well-fitting artificial leg. The left hip is also firmly united.

NOTE: Since writing this paper, I have obtained a report from the Minneapolis General Hospital, through the courtesy of Dr. E. A. Regnier, in which the tourniquet was applied in twenty cases with sixteen deaths, or a mortality of 80 per cent. The high mortality rate is due to the fact that the tourniquet operation was used only in almost moribund cases who would tolerate only ice anesthesia and in whom general or spinal anesthesia were definitely contraindicated. The report also con-

cludes, however, that in no case could death be attributed to the use of the tourniquet.

Conclusions

The tourniquet amputation is an expedient to be used for those patients in whom an extremity must be sacrificed but in whom a classical amputation would be extremely hazardous in the presence of forbidding surgical risk. The tourniquet may be used for only a few days, at which time a classical operation may be done if the improvement in the patient's physical state warrants, or it may be allowed to remain on until a guillotine amputation has been accomplished, except that it is necessary only to divide the insensitive, compressed tissue and bone. The odor from the gangrenous extremity is prevented by the use of formaldehyde solution. We are convinced by our own experience that lives have been saved which might otherwise have been lost.

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Discussion

DR. A. A. ZIEROLD, Minneapolis: I had understood that Dr. Regnier was to discuss this paper, and in his absence I have not had an opportunity to review his material. It is my recollection that several years ago we asked Dr. Maxeiner to come to the General Hospital, where he is a consulting surgeon, to demonstrate this procedure, and that we have used it since that time with a great deal of satisfaction. There is no question but that Dr. Maxeiner has added to our surgical development by this technique.

Some years ago, Cannon, in his studies on shock, demonstrated the value and danger of the tourniquet. If a tourniquet was applied to an extremity and the extremity was traumatized, shock did not develop; but if, after trauma to the extremity, the tourniquet was removed, shock promptly developed. Following Dr. Maxeiner's procedure, it should be possible, in similar cases in which amputation is contemplated, to apply a tourniquet at such a time as to prevent the shock which so frequently occurs following emergency surgery. I do not believe that there can be any quarrel with this technique and this procedure. It seems to be very reasonable. At the Minneapolis General Hospital we have used this method in individuals who had sustained injuries to the extremities and later developed infections which jeopardized the life of the individual, and the results have been very gratifying. We have not extended its use to the treatment of diabetic gangrene or to gas gangrene, but I believe we shall do so in the future. It is particularly interesting to note the results that Dr. Maxeiner cites in cases of gas gangrene treated by a tourniquet. Without this evidence, I should hesitate to use this method. I believe this technique will in many cases displace refrigeration anesthesia. Certainly it is quite as effective and much less trying to the patient and the hospital staff. I believe that we should be congratulated upon our opportunity to hear so new and so satisfactory a technique as Dr. Maxeiner has described.

DR. H. B. ZIMMERMANN, St. Paul: I have had absolutely no experience with Dr. Maxeiner's technique,

but it seems entirely reasonable to me, and, if the occasion arises, I intend to use it. I was interested in his use of formaldehyde. I was at one time House Officer at General Memorial Hospital, in New York, and the patients with malignancy who were sent to the cancer hospital usually had very far advanced involvement. It was the custom there to do just as Dr. Maxeiner did, placing dressings of formaldehyde over the ulcerating lesion, even injecting the formalin with a needle right into the breast. Apparently it did no harm, and the patients improved after the treatment. The breasts dried up and were easily amputated. I have done that in cases of advanced and ulcerating malignant disease.

DR. DONALD MCCARTHY, Minneapolis: Those persons treated by this method whom I have seen have done very satisfactorily, and there has been lessening of the toxemia almost immediately upon the application of the tourniquet.

DR. MAXEINER (in closing): I appreciate Dr. Zierold's kind remarks and realize that this is not a much used procedure. My idea in bringing it forth again is to endeavor to bring to the attention of the profession a procedure which we believe has great value in a certain group of patients who are critically ill. It is not an operation of election but one rather of desperation.

The meeting adjourned.

A. E. CARDLE, M.D., *Secretary*

MINNEAPOLIS HEALTH STATISTICS

(Continued from Page 177)

pected cases already under observation an increase in the number of reported cases of tuberculosis in 1948 compared to average years is expected.

It is to be emphasized that these increases in reported cases does not mean that tuberculosis is more prevalent but rather that more unknown and unsuspected tuberculosis in apparently healthy people is being found and reported to the health department.

Real progress in venereal disease control was achieved during the year with a reduction in syphilis cases from 737 to 590 in 1946 and 1947, respectively, and a decrease in gonorrhea cases from 1,018 to 808 in 1946 and 1947, respectively.

No cases of smallpox, leprosy, or tularemia were reported during the year. Only one case of typhoid fever was reported.

The health agencies of the city, including the general public, worked together admirably during the past year. Under many handicaps, the hospitals, the physicians and the nurses of the community have performed a great service. As a result, Minneapolis has maintained the enviable position in the forefront of the large cities as a healthful place in which to live.

OPPORTUNITIES IN OVERSEAS PRACTICE

The U. S. Army Medical Department announces the availability of opportunities for advanced training and experience in the various special fields of medicine and surgery in overseas Army hospitals in Germany and Austria. These hospitals are registered with the AMA, and credit is given time spent in assignments to the specialties in them by the various specialty Boards. Eligible physicians should communicate with the Surgeon General, U. S. Army, Washington 25, D. C.

MINNESOTA MEDICINE

Minneapolis Surgical Society

Meeting of October 2, 1947

Dr. Thomas J. Kinsella, Presiding

THE SPHINCTER OF ODDI IN MAN

GEORGE S. BERGH, M.D.

Minneapolis, Minnesota

The discharge of bile into the duodenum is dependent upon the pressure of bile secretion, the activity of the gall bladder, and the tonus of the sphincter of the bile duct. Although attention has been directed to the biliary tract since antiquity, accurate knowledge of the sphincter of Oddi has been acquired only relatively recently.³

Anatomical Considerations

It has been established that there is a distinct sphincter at the terminal portion of the bile duct, and that this muscle develops independently of the duodenal musculature.⁸

As the bile and pancreatic ducts enter the duodenal wall they pass through a lengthwise hiatus in the longitudinal muscle and a transverse fenestra in the circular muscle. Boyden¹⁴ has classified the muscles of the choledcho-duodenal junction into (1) muscles of the choledcho-duodenal aperture, and (2) intrinsic muscles of the ducts and ampulla.

The muscles of the choledcho-duodenal aperture include: (1) the superior and inferior margins of the choledochal fenestra, which impinge upon the ducts at only one level and differ in this respect from the anatomical arrangement in animals such as the dog; (2) reinforcing fibres (R-fibres) at the angles of the fenestra; and (3) connecting fibres (C-fibres) which secure the margins of the hiatus and fenestra to the papilla and ducts.

The intrinsic muscles of the ducts and ampulla include: (1) the sphincter choledochus, (2) the longitudinal fascicles, (3) the sphincter pancreaticus, and (4) the sphincter ampullae.

The sphincter choledochus is the most highly developed portion of the intrinsic sphincter of Oddi. It consists of an annular sheath of muscle fibres surrounding the bile duct from a position just outside the window to the junction with the pancreatic duct. It is capable of obstructing the flow of bile without closing the pancreatic duct. The sphincter pancreaticus is an annular band of fibres around the lower end of the pancreatic duct. It is not constant. The sphincter ampullae surrounds the ampulla, when the latter structure is present, and also encircles the lower end of the bile and pancreatic ducts. Kreilkamp and Boyden¹⁴ found it to be well developed in only one-sixth of adults. Contraction of this muscle prevents the flow of bile and pancreatic juice into the duodenum and may permit the reflux

of bile into the pancreatic duct or of pancreatic juice into the bile duct. The longitudinal fascicles consist of two columns of longitudinal fibres lying between the choledochus and the pancreatic duct. They probably serve to erect the papilla and facilitate the discharge of bile.

Physiological Considerations

There are marked species differences between the sphincter of Oddi of man and that of the common laboratory animals. On the basis of structural differences, anatomists have correctly predicted that the activity of the human sphincter would differ from that of animals. Boyden⁷ has pointed out that, in man, the window in the duodenal muscle through which the bile and pancreatic ducts enter the intestine is of such shape and size that duodenal peristalsis exerts a minimal effect on the flow of bile. By contrast, the duodenal window of the dog has the shape of a funnel which envelops the first two-fifths of the intramural course of the bile duct. Most observers agree that, in animals, duodenal motility and tone exert a powerful influence on the flow of bile into the duodenum. But these factors are less important in man. Furthermore, it has been demonstrated⁶ that the human sphincter of Oddi functions independently of the duodenal musculature. When we speak of the sphincter in a physiological sense, however, we may refer to the entire intramural regulatory mechanism, including both the action of the true sphincter and any influence which might be exerted by the muscle of the intestine.

The first activity to be attributed to the sphincter mechanism is the prevention of regurgitation of duodenal contents into the common bile duct, although the mucosal folds arising in the ampulla may be even more important in accomplishing this. When the sphincter action is eliminated, such as occurs in cases of internal biliary fistula, some degree of ascending infection follows. This infection usually is subclinical, but occasionally it may be severe. For this reason, Paine¹⁸ has emphasized the importance of preserving the sphincter of Oddi whenever possible in reconstructive operations for stricture of the bile ducts.

A second function of the sphincter is to regulate the flow of bile into the intestine. Although bile is secreted continuously it is admitted to the duodenum only intermittently, depending upon the state of contraction of the gall bladder and of the sphincter of the bile duct.

A third function of the sphincter of Oddi is to aid in filling the gall bladder. If the sphincter mechanism be destroyed, the gall bladder does not fill and the bile flows directly into the intestine. If concentrated gall-bladder bile has any superiority over unconcentrated hepatic bile in the process of digestion, the part played

Inaugural thesis.

in the filling of the gall bladder is an important function of the sphincter of Oddi.

A fourth function, attributed to joint action of the longitudinal fascicles and the connecting fibres, is to erect the papilla and facilitate the discharge of bile into the duodenum.

The extent of nervous control of the sphincter of Oddi still is not settled. The so-called Doyon-Meltzer law of reciprocal innervation of the gall bladder and sphincter maintains that when the gall bladder contracts, the sphincter relaxes as a result of reflex excitation. Apparently a reciprocal relationship actually does exist, at least under certain circumstances, but there is no good evidence that it is under nervous control in man. There is evidence, on the other hand, suggesting that the hormone, cholecystokinin, which causes the gall bladder to contract also produces relaxation of the sphincter of Oddi. Painful sensations identical with biliary colic may be produced by spastic contraction of the sphincter of Oddi in man.^{4,15} The pain in some cases remains localized in the epigastrium or right hypochondrium, while in other cases there is radiation to the interscapular or right subscapular region. Associated with the pain, there may be abdominal muscle spasm and inspiratory distress, and occasionally nausea and vomiting. Schragar and Ivy²⁰ have demonstrated that in animals similar pain responses may be abolished by splanchnic section, and nausea and vomiting may be abolished by section of the vagi. It has been assumed that the sensory innervation of the sphincter in man is similar. Snell, McGowan and Butsch²¹ have reported three patients upon whom right splanchnic section was undertaken in an attempt to relieve postcholecystectomy pain. The procedure was successful in one case. Experimental work of Boyden and Johnson¹³ indicates that the lesser splanchnics and first lumbar roots of the celiac plexus may also participate in the conduction of pain impulses from the sphincter of Oddi.

Sphincter Resistance

The force which is exerted by the sphincter mechanism resisting the flow of fluid from the bile duct into the duodenum may be measured in patients with intubation of the common bile duct. Although sphincter resistance cannot be determined in entirely normal individuals, we have considered the measurements obtained in cholecystectomized and choledochostomized patients who had recovered from their operation, who were feeling well, and who had fasted for eight hours, as "normal." In such cases the sphincter can withstand pressures between 9 and 23 centimeters of water, and the sphincter resistance is most often around 12 to 15 centimeters. Changes of a few millimeters in the intraductal pressure occur during respiration, and marked changes are apparent during coughing, laughing or vomiting as a result of temporarily increased intra-abdominal pressure.

In some patients with choledocholithiasis, the sphincter may be irritable and may remain irritable for weeks or months after choledocholithotomy. In such cases the muscle readily goes into spasm and the intramural resistance may reach 30 or 40 centimeters of water or

more, and usually fluctuates through a wide range instead of becoming stabilized. Such irritability probably is due to an inflammatory lesion—choledochitis secondary to stone. After several months of external drainage of the duct, the irritability disappears and the sphincter apparently returns to normal. These observations have led us to utilize sphincter resistance tests as one of the criteria for the determination of the proper time for removal of choledochostomy tubes.³ The drainage tube is not withdrawn until the sphincter resistance is normal and examination reveals that the muscle is not irritable.

To hasten the return of the sphincter to normal, MacDonald¹⁶ has advocated the use of postoperative perfusion of the biliary duct system with warm saline solution. If such irrigations are carried out, pressures only slightly above the sphincter resistance should be used. Forceful irrigations not only produce pain, but also may cause a recrudescence of an existing choledochitis with fever, general malaise, and sometimes even jaundice.

Mixer and Rigler¹⁷ have shown that only moderate elevation of intraductal pressures may cause regurgitation of bacteria from the bile ducts into the blood stream. Diodrast or thorotrast, introduced into the ducts for purposes of cholangiography, likewise may be regurgitated into the blood stream if they are injected under pressure.

Hypertrophy of the sphincter muscle may occur in patients with an irritable sphincter, and several procedures have been suggested to combat such a condition. The most common procedure is gentle dilatation by the passage of graduated sounds at the time of operation. Any such instrumentation must be carried out gently to avoid tearing of tissues with subsequent scar formation. Colp and Doubilet⁹ have advocated actual section of the sphincter with a special instrument which they have designed.

Response of the Sphincter to Food

It is well known that the ingestion of a meal is followed by a flow of bile into the intestine. Studies concerning the effect of various foods upon the activity of the sphincter of Oddi have demonstrated that ingestion of a fatty meal consisting of egg yolks and cream causes relaxation,² proteins occasionally produce relaxation, but neither a carbohydrate meal nor glucose given intravenously has any significant effect. Water taken by mouth also fails to produce a change in sphincter resistance.

Response of the Sphincter to Drugs

Morphine, codeine, pantopon and dilaudid produce prompt and prolonged contraction of the sphincter of Oddi.³ In spite of that effect they are useful for the relief of biliary colic because of their central effect in the relief of pain. Utendorfer²² has accumulated data which indicate that demerol also produces central relief from the pain of biliary colic without producing spasm of the sphincter of Oddi.

Amyl nitrite and nitroglycerine produce relaxation of the sphincter, but erythrol tetranitrate is ineffective. Trasentin, epinephrine, ephedrine, histamine and ethyl

alcohol sometimes produce sphincter relaxation, but the effects are inconstant.⁸

Magnesium sulfate⁶ may produce sphincter relaxation with or without an initial contraction; it may produce an initial contraction followed by a return to the original tonus level, or there may be no effect. Relaxation, when it does occur, usually is not great, and contraction of the gall bladder following administration of magnesium sulfate probably is more important than sphincter relaxation in producing a flow of bile into the duodenum in patients with a functioning gall bladder.

Although atropine¹ does produce sphincter relaxation in the dog, it does not have any significant action upon the sphincter of Oddi in man, even in doses up to one-fiftieth of a grain. Pilocarpine, papaverine, posterior pituitary extract, benzedrine, prostigmine and caffeine sodium benzoate likewise have no significant effect upon the sphincter. The effects of sodium dehydrocholate, histamine, epinephrine, ephedrine, calcium gluconate and calcium chloride are not constant.³

Biliary Dyskinesia

As early as 1761, Morgagni suspected that spasm of the bile duct might produce clinical disorders. Oddi, with his more complete understanding of the anatomical arrangement of the muscular sphincter of the duct, advanced that proposition. More recently the importance of sphincter spasm in its relation to symptoms has been emphasized by many investigators. Ivy, Voegtlin and Greengard¹² have shown that motor dysfunction may cause biliary colic in normal human subjects with non-inflamed biliary passages. Observations made upon patients with choledochostomies also demonstrate clearly that spasm of the sphincter can produce pain. Pavel¹⁰ has reported cases of functional obstruction with jaundice.

Presumably, therefore, a purely functional derangement (biliary dyskinesia or biliary dyssynergia) may produce spasm of the sphincter of Oddi with resultant biliary colic. In most instances, however, irritability of the sphincter is probably on an organic basis. Snell, McGowan and Butsch²¹ have suggested that local inflammatory processes may induce sphincter spasm, and Ivy and Goldman¹¹ have pointed out that inflammation of the ampulla could make the muscle hyperirritable. Reflex contractions of the sphincter secondary to disturbances in more remote organs have not been demonstrated in man.

Sudden distention of the bile ducts produces deep epigastric or right upper quadrant distress. Gradual distention, on the other hand, produces no pain. The pain due to distention is less severe than pain due to sphincter spasm, and it is of a different character. Distention produces a dull distress, while sphincter spasm produces a sharper pain typical of biliary colic. In this connection it must be remembered that sudden distention of the bile ducts may cause the sphincter to go into spasm.

Ivy¹⁰ has pointed out that a spastic sphincter can exert a resistance to flow greater than the force exerted by maximal gall-bladder contraction. Therefore, if the gall bladder contracts rapidly against a spastic sphincter, a sudden distention of the bile ducts occurs. Such conditions could lead to pain.¹⁰

Clinical diagnosis of biliary dyskinesia is extremely difficult. Symptoms may be ascribed to a functional disorder only after every effort has been made to rule out the presence of an organic lesion. Ivy¹⁰ suggests that occasionally one may secure circumstantial evidence in support of the diagnosis. If the typical pain can be reproduced by administration of a fatty meal, cholecystographic studies should be carried out. Visualization of the cystic and common bile ducts after administration of a fatty meal is not unusual. But visualization of the hepatic ducts indicates that the gall bladder is expelling concentrated bile faster than the bile enters the intestine. Pain may result from spasm of the sphincter or distention of the ducts. However, more often the patients do not complain of pain, even though the hepatic ducts may be visualized during cholecystography.¹⁰ Furthermore, negative cholecystographic studies do not entirely eliminate the possible existence of an organic disease.

Delayed evacuation of the gall bladder during cholecystography is not sufficient evidence for a diagnosis of dyskinesia, since the normal variation is great.¹⁰

Effect of Cholecystectomy upon the Sphincter

Since the time of Oddi, a number of investigators have recognized that extirpation of the gall bladder in certain animals, such as the dog, cat, and goat, and also in man, may be followed by dilatation of the biliary ducts. Several explanations have been advanced to account for this change. The most widely accepted explanation is that the dilatation is the result of increased intraductal pressure following cholecystectomy. This theory depends upon a persistence of action of the sphincter of Oddi. In the absence of the gall bladder, which normally acts as a pressure regulator, the increased pressure must be accommodated by dilatation of the duct. Our observations, and those of other investigators, support this view.³

Whether tone or response of the sphincter in man is altered by cholecystectomy cannot be stated definitely, since all studies have been made in individuals who have been operated upon. However, measurements of sphincter resistance in patients with choledochostomy tubes indicate that the sphincter does maintain tonus and activity following cholecystectomy, and the figures obtained are similar in range to those found in normal dogs.

In some cases the sphincter may exert abnormally high resistance to bile flow and may show irritability and go into spasm. A spastic sphincter may be one of the causes of postcholecystectomy colic.

Summary

The intrinsic sphincter of the common bile duct is anatomically and physiologically distinct from the duodenal musculature.

Functions which have been attributed to the sphincter of Oddi are: (1) making possible the filling of the gall bladder, (2) preventing the regurgitation of intestinal contents into the bile duct, (3) regulating the discharge of bile into the duodenum, and (4) erecting the papilla.

The force which is exerted by the sphincter mechan-

ism resisting the flow of fluid from the bile duct into the duodenum may be measured in patients with intubation of the common bile duct. Normal sphincter resistance varies between 9 and 23 centimeters of water, and usually it is around 12 to 15 centimeters of water.

In some patients with choledocholithiasis the sphincter may be irritable, and may remain irritable for weeks or months after choledocholithotomy. After prolonged external drainage of the bile duct, the irritability usually disappears and the sphincter returns to normal.

Any substances injected into the bile ducts for treatment or diagnosis (e.g., cholangiography) should be injected gently. Only moderate elevation of intraductal pressure may cause regurgitation of bacteria into the blood stream. Forceful irrigations may also cause a recrudescence of an existing cholechitis with fever, general malaise, and sometimes even jaundice.

The ingestion of a fatty meal causes relaxation of the sphincter, proteins occasionally produce relaxation, but neither a carbohydrate meal nor glucose given intravenously has any significant effect.

Morphine, codeine, pantopon and dilaudid produce contraction of the sphincter of Oddi. Demerol does not cause spasm of the sphincter.

Amyl nitrite and nitroglycerine produce relaxation of the sphincter.

The sphincter of Oddi is of clinical significance. Purely functional derangements may produce spasm of the sphincter with resultant biliary colic. If the gall bladder contracts against a spastic sphincter, distress may be produced as a result of sudden distention of the ducts. In most cases, however, irritability of the sphincter is probably on an organic basis.

Sphincter tone persists after cholecystectomy. The increased intraductal pressure which occurs in the absence of the gall bladder results in dilatation of the bile ducts.

A spastic sphincter of Oddi may be one of the causes of postcholecystectomy colic.

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OPERATIVE AND NON-OPERATIVE METHODS IN THE MANAGEMENT OF COMMON DUCT LESIONS

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In presenting this subject of common duct lesions, I am first going to discuss the diagnosis briefly. In the recent war, many of us saw many cases of jaundice. Occasionally, we were confronted with cases of suspected infectious hepatitis where severe distress and colic-like pain were described, and the differential diagnosis was difficult. Of the many cases I saw in consultation with several excellent internists, we erred in only one instance by advising an operation in a case of infectious hepatitis. This soldier had had repeated hospitalizations for jaundice and colic. I did not remove the gall bladder but merely excised a section of liver for microscopic study. I believe we, as surgeons, should be of some help to our medical colleagues by also being acquainted with the picture of infectious hepatitis. Pain, colic and jaundice, especially when attacks are repeated, favor a surgical jaundice. I know of no test which determines definitely and at all times whether the individual has a surgical jaundice or a nonsurgical jaundice, so we must depend largely upon the history and careful analysis of the many laboratory tests.

The jaundice of infectious hepatitis develops fairly rapidly but usually lasts only a week to ten days, after which the jaundice progressively subsides. Rarely is the stool acholic for more than a week. In cases with stones, whether colic is present or absent, the jaundice level is usually fluctuating but may or may not be prolonged. In jaundice due to malignancy, the icteric changes are continuous and progressive until surgical intervention. I believe we all delay surgical intervention when a patient is jaundiced. Usually one is not warranted to advise operation until after several weeks of observation unless the diagnosis of stone or malignancy can be definitely established.

Patients with jaundice are many times very uncomfortable during the time we are trying to make a diagnosis, attempting to improve liver function, correcting fluid balance and protein levels, and improving the prothrombin time. I have tried many means of relieving the intense itching. Usually 5 to 10 per cent glucose so-

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lution intravenously gives relief for two to three hours or even longer. Ergotamine tartrate, in dosages of .25 mg. subcutaneously or 1 mg. orally, may be helpful, although this may be contraindicated where liver function tests show considerable damage. Many times it is not present in the jaundiced individual. In several cases, I have tried sodium thiosulfate in .5 gm. to 1 gm. doses intravenously, but certainly this is not the answer for all individuals. Novocaine intravenously over a 2-hour period has been advocated, using a 1 gm. dose in 500 c.c. of intravenous solution. Quite frequently this gives relief for some six to ten hours. The most helpful application for the patient to use himself is the following modified calamine lotion:

Phenol	dr. 1
Pulv. calamine prep.	dr. 1
Zinc oxide	dr. 2
Glycerin	dr. 2
Liquor hamamelis	oz. 1
Aqua Rosae	oz. 1
Milk of magnesia q.s. a.d.	oz. 6

Mix small amounts of this with equal amounts of Parapsyllium or Petrolagar and apply as necessary for itching.

This mixture without the oil gives only momentary relief in itching from jaundice, for as soon as the solution dries, itching is worse, as dry skin is more uncomfortable than moist skin. This accounts for mixing it with an oily base. I have been happy about the comfort this mixture affords patients.

When the decision has been reached that surgical interference is indicated and the patient has been properly prepared, regardless of whether or not the jaundice has subsided, the common duct must be opened and explored. If no obstructing agent is found along the common duct or hepatic duct, and the conclusion is reached that the diagnosis is in error, a section of liver should be excised for microscopic study. This will possibly confirm the existence of an intrahepatic and nonsurgical type of jaundice.

In cases of surgical jaundice, in addition to a history of jaundice, the common duct should be opened under the following conditions, namely, palpable stones or tumor within the duct, dilatation of the duct, sclerosis or thickening of the duct wall, history of repeated chills and fever, and small stones within the gall bladder. However, in the past seven years, I have not so frequently opened the common duct when small stones were present in the gall bladder because the biliary flush has proved quite successful in removing small stones and debris from the common duct. This confidence is also based upon the success of the flush in removing larger stones which have been visualized by cholelithograms, and by a definite decrease in the postcholecystectomy syndrome in patients who have been operated upon for biliary tract disease and have had the biliary flush. In the last 100 cholecystectomy cases, the common duct was opened in twenty-four instances (24 per cent), and stones removed from the common duct in sixteen (16 per cent). At one time, I was opening the common duct in 40 per cent of the cases.

Is there danger in opening the common duct? I believe

TABLE I. INCIDENCE OF LIVER STONES IN CHOLELITHIASIS

Cases of Cholelithiasis	Cases of Liver Stone	Incidence Per Cent	Author	Year Reported	Country
Not given	Not given	5.0	Thudichum	1863	Germany
Not given	Not given	9.0	Schroeder	1892	Germany
72	6	8.3	Beer	1904	Germany
257	20	7.7	Miyake	1913	Japan
97	7	7.2	Hansen	1926	Norway
30	2	6.6	Best	1943	U.S.A.
436	35	7.4*			
		7.6**			

*Average of all percentages

**Average excluding first 2 groups

very little harm results from this procedure. A stricture has never developed in my experience, and the only accident occurred very recently when I was working around the common duct in a heavy-set individual in whom I knew there was some anomaly but which I could not figure out. While we were opening the common duct, a severe hemorrhage occurred, filling the abdomen and operative field with blood. This was controlled immediately by pressure on the hepatic artery, as it looked like arterial blood. After clearing the field, oxidized gauze (Hemopak) was used and the bleeding was controlled. This is my only experience with a severe arterial hemorrhage controlled by oxidized gauze. Repeated exploration of the region did not disclose an end or side of a vessel which should be ligated. Fresh oxidized gauze was applied to the area, and no post-operative hemorrhage occurred.

The most frequent source of remaining common-duct stone is the stone which is overlooked at the first operation. Not infrequently the common duct is opened and explored and no stone found, but the delayed cholangiogram reveals the presence of such a stone. Probably the next most common source is the hepatic or hepatic-duct stone which reaches the common duct following operation. It is possible that stones may form in the common duct later, but it is most likely that the nucleus of such a stone is a small unidentified stone which later collects debris and precipitate. Also, small stones may be dislodged into the common duct during cholecystectomy.

What is the incidence of liver stones in cholelithiasis? Perusal of routine autopsy reports will not reveal such a finding. Rarely does the pathologist slice the entire liver sufficiently thinly and explore the intrahepatic ducts for stones. A few years ago, I thoroughly examined the liver at the autopsy table in thirty patients who had died of various causes but whose gall bladders contained stones. Two of these had stones within the ducts of the liver. The literature was then reviewed, but there were few reports on the true incidence of liver stones. Table I summarizes by findings in the literature. This is a collection of 456 cases of cholelithiasis where the liver was thoroughly investigated, and liver stones were found in thirty-five cases, an incidence of 7.5 per cent for liver stones in cases of cholelithiasis. This figure is certainly of some significance as to the etiology of the postcholecystectomy syndrome which has been caused by a common-duct stone.

It is my impression that if we produce a physiologic flush of the intrahepatic and extrahepatic ducts, unidentified stones in the common duct and debris remaining

in the common duct, which can be the nucleus of common-duct stones, may be flushed out and prevent later common-duct symptoms and difficulties. We are able to increase the bile flow by giving the patient a hydrocholeretic, which results in a 100 to 200 per cent increase of bile flow. The bile produced by a hydrocholeretic is thin and watery, differing from the average bile produced by a choleretic (plain bile salts). This increased flow of bile has been determined in a rather large group of patients and the resulting increased ductal pressure has also been measured in patients with an indwelling common-duct T-tube. Our experiments have been with decholin and procholol, but we have reason to believe that ketochol has the same effect. In establishing a flushing effect, one should take advantage of every means of relaxing the choledochal sphincter area, which would then permit passage of the stone, stones or debris into the duodenum. We feel that the following three-day regime has given the best results. Usually a rest of a few days to several weeks is given between flushes. Under no circumstances should the three-day biliary flush be given when the common duct is completely obstructed.

Three-day Biliary Flush Regime

1. Take three of the larger tablets (Procholol or Decholin) after each meal and at bedtime for three days.
2. Take 1 teaspoonful of magnesium sulphate in water each morning.
3. Take 2 tablespoonfuls of pure cream or olive oil before noon and evening meals and at bedtime.
4. On the first day, place one of the nitroglycerin tablets (1/100 gr.) under the tongue before each meal.
5. On the second day, dissolve one of the atropine tablets (1/100 gr.) in a little water and take before each meal.
6. On the third day, repeat the nitroglycerin tablets as on the first day.

There have been some rather dramatic expulsions of remaining stones from the common duct. That success has been attained in removing common-duct stones has been revealed by postoperative cholangiograms in about 40 per cent of the cases. Frequently, additional means have been employed to promote dislodgement of the stone. Daily irrigations with warm saline followed by warm olive oil are almost routine. Occasionally, warm iodized oil seems to be more beneficial. At times, additional antispasmodics are necessary to afford sufficient relaxation of the choledochal sphincter area. Aminophyllin in 7.5 grain doses has been used as recommended by Means and Delor, Gladstone, and Goodman and Cole. Arrest of the spasm of the sphincter area may be accomplished by instillation of 5 to 10 c.c. of a 1:500 solution of nupercaine solution, as recommended by Harris and Marcus of San Francisco. Fragmentation or chemical reduction of the stone has also proven most helpful in our experience. Pribam introduced ether as a solvent of certain gallstones, and later this was modified by Osterberg to a mixture of $\frac{3}{4}$ ethyl ether and $\frac{1}{4}$ ethyl alcohol, which we have used. There have been some reports that this drug has damaging effects on the liver. Boyce does not believe ether to be too dangerous. Raffl made some experimental studies of the effect of ether on cells of the liver and bile ducts and concluded that if

provision is made for escape of the solution, so as to prevent the building up of too high an intrahepatic or intraductal pressure, cellular injury does not occur. He recommended a double catheter arrangement, the second tube being an escape vent for the vaporizing ether. We have depended upon careful manipulation of the plunger in the syringe, pulling it back as the patient's pain becomes severe and then reinjecting as the pressure decreases. A mixture of 3 c.c. of ethyl ether and 2 c.c. of ethyl alcohol has been used in our cases each day during the flush treatment. In every instance, the patient has complained of pain, but usually there is complete relief as the plunger of the syringe is drawn back. On one occasion, where we had used this solution some six times with six series of flushes, the patient became rather listless for a few days, and we suspected some possible liver shock. The amount of bile flow decreased and became rather light in color. We immediately instituted all means of building up liver function, and the bile flow returned to normal in four days. A check-up cholangiogram revealed that the stone in the common duct had been dislodged. A few days later, the T-tube was removed, and the patient has remained well, it now being over a year. In this particular instance, three flush treatments—two with daily instillations of the ether-alcohol mixture—had been tried without success. The patient was sent home for three months and advised to take the three-day flush treatment every two weeks. On her return to the hospital, and following three more flush treatments with ether-alcohol instillations, this questionable effect on liver function occurred. In other cases, we have been successful in dislodging stones after repeated efforts, which included the patient going home for several months and then returning for further treatment. Walters and Wesson, Morton and a few others have reported success with the use of the ether-alcohol mixture.

There has been a search for a more effective solvent which is innocuous to living tissue. Narat and Cipolla in 1945 reported on the use of chloroform. Chloroform, like ether, is a solvent for cholesterol, but in addition causes dissolution of bile pigment. They injected warm chloroform (heated to 38° C. or 100.4° F.) into the gall bladder and common duct of dogs, and then after sacrificing the animals, studied the microscopic sections of the biliary ducts and liver. They concluded that injection of chloroform did not produce any demonstrable changes in the liver, gall bladder or extrahepatic ducts. However, they felt that repeated injections in the postoperative period should be discouraged, as they might represent a potential hazard. They favor the use of chloroform at the operating table in the management of the elusive stone. We have used chloroform on two patients, and in one case (two instillations), in conjunction with the biliary flush, the stone was dislodged. We used 5 c.c. of heated chloroform on two successive days. However, until after further observation, one should be a little cautious in using chloroform.

Goldman, Jackman and Eastman reported on the use of Solution G as a solvent for remaining common-duct stones and detailed the success in two cases. This is an interesting report, as the *in vitro* experiments were disappointing. However, the method should be kept in mind

and tried further. We have used it in one patient without success, but also all other methods failed. The formula of Solution G is as follows:

Citric acid (monohydrated)	32.25
Magnesium oxide (anhydrous)	3.84
Sodium carbonate (anhydrous)	4.37
Water q.s. a.d.	1000.00 c.c.

This solution is permitted to drip into the common-duct T-tube at the rate of 30 drops per minute, and may be repeated several times daily.

It is our routine in all cases of biliary tract operations to start the biliary flush on about the eighth postoperative day and repeat it in about two weeks. In cases where the delayed cholangiogram reveals a stone in the lower end of the common duct, the biliary flush is used in conjunction with the other agents as just discussed. In these cases, we have been successful in removing stones in about 40 per cent of the cases. Some of these cases have been primarily operated upon by me and others by surgeons elsewhere.

Secondary operations on the biliary tract are difficult and carry a greater hazard than the primary operation. Therefore, this non-operative management is strongly recommended before a secondary operation is considered. Even the secondary operation may be unsuccessful in locating and removing the elusive stone. We have seen as many as eleven stones remaining in one common duct, and by the flush method have recovered the stones from the stool. Also we have dislodged some large intact stones from the common duct and recovered these from the stool when our imagination could barely stretch to the possibility that these stones had escaped through such a narrow area. Improvements in methods for fragmentation and dissolution of the common-duct stone are wanting.

The development of a stricture of the common duct following cholecystectomy is a major complication. This may express itself by development of a biliary fistula with acholic stools or appearance of jaundice. I have not been successful in my attempts with plastic procedures, and either depend on anastomosing the proximal duct to a loop of jejunum or placing some type of rubber or vitallium tubing in the duct and reconstructing the duct over this material. Where the hepatic duct is anastomosed to the intestine, I prefer to divide the upper jejunum and anastomose the distal end to the hepatic duct over a vitallium tube (Cole) and re-establish continuity by an end-to-side anastomosis. Where continuity of the duct can be re-established, which is probably the method of choice because of preserving the common duct sphincter mechanism, I prefer using the vitallium tube. I have modified the ends of my vitallium tubes slightly by having the manufacturer drill six staggered holes near the upper end. Usually the upper end of this metal tube projects into the portohepatis area of the liver, and I have felt that some of the poor results reported have probably been occasioned by the tube draining one segment of the liver but blocking drainage from the other duct or ducts converging in this area. These small perforations may prevent this complication.

The flange of the vitallium tube is, if at all possible, fixed into the liver or scar tissue with a silk suture. All of these patients and all other patients with biliary-intestinal anastomoses are directed to take the bile flush the first three days of each month or oftener. Naturally if the choledochal sphincter mechanism is not functioning, it is not necessary to use the antispasmodic agents. Many of these patients are also advised to take small daily doses of one of the hydrocholeretics (two tablets night and morning). The free flow of this watery bile tends to prevent the formation of a precipitate in the tube and if corrosion and encrustation do develop, the thinner bile makes an easier exit.

Malignancy obstructing the lower end of the common duct, whether primary in the duct, papilla of Vater, duodenum or pancreas, usually requires a similar procedure, entailing transection across the lower end of the common duct and removal of the duodenum and head of the pancreas, thus destroying the ductal system between the pancreas and intestinal tract. The one-stage operation is preferable, but occasionally the two-stage procedure is advisable. If the two-stage procedure seems indicated, the first stage consists of transecting the jejunum quite some distance from the duodeno-jejunal angle and anastomosing the distal end to the gall bladder or common duct. An anterior gastro-jejunostomy is made and the proximal end of jejunum anastomosed end-to-side to the single limb of the jejunum leading to the hepatic area. If the second stage does not seem advisable, short-circuiting routes for the obstructed bile and the duodenal contents have been established. If the lesion is inflammatory, adequate rest has been provided for the duodenum and the lower end of the common duct. In the one-stage procedure, Cole's modification of the Whipple method is preferred. At the present time, I feel that the open end of the transected pancreas should be implanted into the side of a limb of the jejunum. My own experiences with this procedure have not been very favorable as to longevity before recurrence. As one reviews case reports, three- and five-year cures are unusual. In fact, in some cases where only the palliative procedures as described in the first operation for the two-stage procedure have been used, comfort and longevity have been about the same as with the radical procedure. Error in diagnosis between malignancy and an inflammatory lesion involving the pancreas is sometimes a problem in surgery of this region.

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Discussion

DR. JAMES HAYES: I would like to ask Dr. Best if he uses his flush procedure on all T-tube cases whether they have any unfavorable symptoms or not.

DR. BEST: Yes, in all cases. In routine cholecystectomy cases, the patient is given the flush on about the eighth postoperative day, and this is repeated two weeks later. After removal of a T-tube, I usually wait twenty-four to forty-eight hours and then start the biliary flush. This is repeated two weeks later.

DR. HAYES: How long is it since you put in your first vitallium tube? I put one in about six years ago. The patient has been perfectly well since. Two years after operation the tube could be seen in place. Today the tube does not show with the x-ray, but the patient seems perfectly well. I have two other patients with vitallium tubes in for four and five years, respectively. They have both been perfectly well since the operation. All of these patients had been operated upon more than once before the vitallium tubes were inserted. I was wondering how long you had observed this tube in place?

DR. BEST: Two years is the longest I have had a vitallium tube in place. I believe that putting the holes in the end of the tube is an advantage. I can tell better in another year or two.

DR. CLARENCE DENNIS: I helped Dr. John Paine put a tube in before he joined the army, and while he was away I had to take that tube out. It had passed halfway into the duodenum and had become lodged and covered with concretions. I didn't start the patient with a biliary flush, but I would have been better off if I had. I had to go back and take the vitallium tube out. A silk suture had been put through the flange to hold the tube in place.

I would like to ask another question. With the anastomosis of the type Dr. Allen described, have you found that biliary flushes are successful in taking care of the symptoms of chills and fever when they have developed? I ask this in view of the fact that the biliary flush is designed to depend on the effect of the sphincter in the lower end of the common duct. Good results have followed use of the flush at the University.

DR. BEST: The biliary flush consists of two elements, namely, production of a thin watery bile and measures to relax the sphincter mechanism. In choledochointestinal anastomosis, the production of thin bile and its flushing effect on the tubal system are the only factors to consider.

DR. O. J. CAMPBELL: I would like to ask Dr. Best whether I was misled by my experiment in attempting to dissolve some gallstones which I had previously removed from a gall bladder. The circumstances were as follows:

Following removal of a gall bladder full of stones, then removal of the stones from the common duct, the patient subsequently showed symptoms of a remaining common-duct stone. The T-tube was still in place, and the question arose as to whether to reoperate or to attempt to flush the stones. I took some of the stones which were fresh from the gall bladder, put them in olive oil and alcohol. I do not believe that I used chloroform. At the end of seventy-two hours they were still as solid as they were originally. On this basis I decided that flushing was not feasible, and so I surgi-

cally removed the remaining stones from the common duct.

Under these circumstances, should I have tried to flush anyway?

DR. BEST: Most certainly I would have tried the flush regime, and if not successful the first time, I would have repeated it.

RETINITIS PIGMENTOSA

(Continued from Page 157)

Case Reports of a Sister and Brother

Case 1—J. B., a girl, aged ten, had suffered from nystagmus since fifteen months of age. Her eyes had turned in since she was a baby. She had always been unable to see at night, and had a great deal of difficulty with her school work. There was no history of eye trouble either in the father's or mother's family. The father and mother were not related.

Examination: Vision of the right eye was 4/200; vision of the left eye was 3/200.

Manifest refraction:

R.E. + 8.00S = + 1.000 × 90 = 5/200

L.E. + 8.00S = + 1.250 × 90 = 5/200

Fundus examination revealed extensive pigmentary changes over the entire fundus except in the macula area of both eyes. Visual fields were contracted to one-half the normal size. Color vision was normal.

Case 2—D. B., aged six, a brother of J. B., had suffered from nystagmus since four months of age. His eyes turned in. He had worn glasses since he was two years old. Vision in the right eye was 2/200, in the left eye, 1/100.

Manifest refraction:

R.E. + 5.50S = 20/200

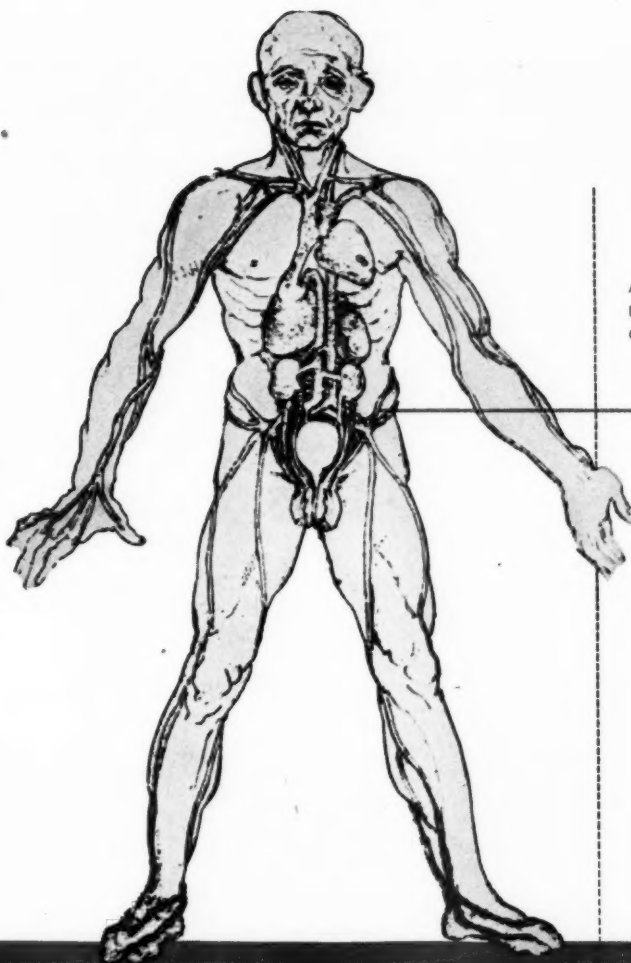
L.E. + 5.50S = 20/200

Pigmentary changes were seen in the periphery of both fundi, about half as numerous and smaller in size than the pigmentary changes in the fundi of his sister. In the peripheral retina there were several areas consistent with gyrate atrophy of the choroid.

These patients now are enrolled in a sight-saving class. Soon they will study braille, as their vision will surely fail.

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Anatomic drawing by
Leonardo da Vinci—
Courtesy, The Bettmann Archive.

Leonardo da Vinci (1452-1519)

was well ahead of his time, for physicians of his day knew little of the function of the heart or the treatment of its diseases, although da Vinci's knowledge of such anatomy was extensive.

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INTERNATIONAL SURGICAL ASSEMBLY

The Sixth International Assembly of the International College of Surgeons will be held in Rome, Italy, at the invitation of the Italian Government, during the week of May 16-23, 1948, under the presidency of Professors Raffaele Bastianelli and Raffaele Paolucci of Rome, and Mario Dogliotti of Turin. The Secretary of the Assembly is Prof. Giuseppe Bendandi of Rome. Attendance is not limited to the membership of the College. All surgeons in good standing in their medical organizations are invited.

Scientific meetings, scientific and commercial exhibits, visits to the Universities of Turin and Milan have been arranged, together with tours to other medical centers in Europe. A special exhibit of ancient texts on surgery is being arranged by Prof. Davide Giordano of Venice, Honorary President, under the active presidency of Prof. Adalberto Pazzini, Professor of History at the University of Rome. This extraordinary exhibit dealing with ancient surgery will be on display in the Vallicelliana Library in one of the historical buildings of the Vatican.

Detailed information may be obtained from Dr. Max Thorek, General Secretary, 850 Irving Park Road, Chicago 13. For travel information, address the All Nations Travel Bureau, 38 S. Dearborn Street, Chicago, the official travel representatives for this Assembly. Those desiring to present scientific papers should address Dr. Karl Meyer, Cook County Hospital, Chicago; Dr. Henry W. Meyerding, Mayo Foundation, Rochester, Minnesota; or Dr. Herbert Acuff, Acuff Clinic, 514 W. Church Street, Knoxville, Tennessee. Those from Canada should direct their inquiries to Dr. Lyon Appleby, 925 W. George Street, Vancouver, B. C.

FELLOWSHIPS IN PHYSICAL MEDICINE

In the past year the American Board of Physical Medicine has been established as a recognized medical specialty. Qualifications for examination for the Board include three years of clinic, hospital and laboratory training in institutions approved by the Board. The Department of Physical Medicine of the University of Minnesota Medical School has established fellowships of one to three years' duration providing the experience and training necessary to fulfill these qualifications.

The departments and institutions affiliated with the Department of Physical Medicine for providing this training include the basic science departments of the

Medical School, the Peripheral Vascular Clinic, the Department of Neurology, Minneapolis General Hospital, Rosemount Poliomyelitis Hospital, Minneapolis Veterans Hospital, and the Section on Physical Medicine of the Mayo Clinic. Rotating fellowships have been set up through these departments to provide experience in diagnosis and treatment of orthopedic, neurologic, vascular, and arthritic diseases. Within this broad general program it is possible to concentrate work on any field of special interest. Likewise, for physicians interested in fields closely related to physical medicine such as orthopedics and neurology, it is possible to arrange special programs concentrating on the problems of those fields. In addition, time and facilities are available to do research on fundamental or clinical problems related to the practice of physical medicine.

The stipend of the Medical School fellowship is \$1,380 per annum. Veterans may obtain subsistence pay up to \$2,400. The fellowships at the Minneapolis Veterans Hospital carry a stipend of \$3,600. All fellowships are granted annually and are renewable for three years.

FELLOWSHIP IN HEALTH EDUCATION

Fellowships leading to a Master's Degree in Public Health in the field of Health Education are again being offered to any qualified United States citizen between the ages of twenty-two and forty, according to a statement released in January by the United States Public Health Service, Federal Security Agency. Funds are available through a grant from the National Foundation for Infantile Paralysis.

Candidates must hold a Bachelor's degree from a recognized college or university at the time the application is filed, and must be able to meet the entrance requirements of the accredited school of public health of their choice. Proof of acceptance at such a school must be furnished before applications are submitted to the Fellowship Awards Committee for consideration. In addition to the Bachelor's degree, courses in the biological sciences, sociology and education are required. Training in public speaking, journalism, psychology and work in public health or a related field is considered desirable.

The fellowship consists of eight or nine months of academic work, which begins with the fall term in 1948, and three months of supervised field experience in community health education activities in a local health department. The academic training includes courses in

(Continued on Page 200)

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Sinusitis, ear infections, bronchitis, and the various forms of pneumonia are frequently ushered in by a cold. Pneumonia, particularly, is likely to attack a person who is overtired, or run-down because of a severe cold.

True, many of these respiratory diseases are not as dangerous as they used to be. (Modern infection-fighting drugs—such as penicillin and the sulpha drugs—offer highly effective treatment for many cases.)

But, of course, it is always better to *prevent* a serious illness whenever possible.

If you have a cold, it's just good sense to stay away

from people, to avoid spreading the infection; and to get plenty of rest—in bed if possible.

If your cold is accompanied by fever, a persistent cough, or a pain in the chest, face, or ear, call your doctor at once.

The sooner you seek his help, the more he can do to help you avoid a long and serious illness.

And, in the case of children, an early examination may disclose that what appears to be only a cold may instead be a starting symptom of an entirely different disease, such as measles or scarlet fever.

SEE YOUR DOCTOR. Never try the foolhardy experiment of dosing yourself. Your doctor's treatment of one illness may be quite different from his treatment of another illness which appears the same to you.

Let your doctor diagnose your ailments. Let him decide what treatment is best for your particular case. Then follow his instructions to the letter. His advice is the only advice you should take on any question that concerns your health.

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REPORTS AND ANNOUNCEMENTS

FELLOWSHIP IN HEALTH EDUCATION

(Continued from Page 198)

public health administration, epidemiology, public health and school education, problems in health education, community organization, information techniques, and others.

Veterans are encouraged to apply, and will be paid the difference between their subsistence allowance under the GI Bill of Rights and the monthly stipend of \$100 for single veterans or \$150 for married veterans. Employees of State or local health departments are not eligible, since Federal grants-in-aid are provided through the States for such training.

Information and application blanks may be obtained by writing the National Foundation for Infantile Paralysis, 120 Broadway, New York 5, New York.

MINNESOTA SOCIETY OF NEUROLOGY AND PSYCHIATRY

The regular meeting of the Minnesota Society of Neurology and Psychiatry was held at the Town and Country Club, Saint Paul, on the evening of January 13.

Elected to active membership were Dr. Roger W. Howell, Dr. Charles M. Jessico and Dr. Lawrence E. Schneider.

The program for the evening included two inaugural theses, one by Dr. Burton P. Grimes and one by Dr. Leonard A. Titrud. The title of Dr. Grimes' paper was "Murder Under Twenty-one," while Dr. Titrud's

paper was entitled "Effect of High Altitude on Brain Injury Cases."

PHI DELTA EPSILON LECTURESHIP

The Minnesota Graduate Club and Alpha Xi Undergraduate Chapter of the Phi Delta Epsilon Fraternity announce their gift of an annual lectureship to the Medical School of the University of Minnesota. The first lecture will be given February 26, 1948, in the Medical Sciences Amphitheater at the University of Minnesota, by Dr. William Roemmich of the United States Public Health Service, whose topic will be "The Chest X-Ray Survey of Hennepin County." The meeting will be preceded by a banquet when the lectureship will be formally presented to the University and accepted by Dean Harold S. Diehl of the Medical School.

SIGMA XI LECTURE SERIES

"The Challenge of Cancer" was the theme of the three 1948 Sigma Xi lectures given at the University of Minnesota during February. Sponsored jointly by the Minnesota chapter of Sigma Xi, scientific research society, and the Minnesota Division of the American Cancer Society, the lectures were presented in Northrop Memorial Auditorium on the University campus and were open to the public.

The first lecture was given on February 6 by Dr. John J. Bittner, director of the Division of Cancer

(Continued on Page 202)



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SIGMA XI LECTURE SERIES

(Continued from Page 200)

Biology in the University of Minnesota Medical School, and was on the subject, "Investigating the Causes of Cancer."

Second lecturer in the series was Dr. Claude F. Dixon, professor of surgery in the Mayo Foundation, Rochester, who, on February 13, spoke on "Cancer Treatment Today."

Concluding the series, Dr. Owen H. Wangenstein, chief of the Department of Surgery in the University Medical School, spoke on February 20 on the subject, "The Cancer Problem Today."

Principal speaker of the evening was Dr. J. F. Norman, Crookston, who discussed prepaid medical care.

RED RIVER VALLEY SOCIETY

Election of officers for 1948 highlighted the annual meeting of the Red River Valley Medical Society, held in Crookston on December 16. Named as president of the organization was Dr. M. J. Bechtel, Warren, while Dr. George Sather, Fosston, was elected vice president, and Dr. R. O. Sather, Crookston, was re-elected secretary-treasurer.

Elected as delegates to the state association were Dr. T. F. Bratrud, Thief River Falls, and Dr. Eskil Erickson, Halstad, with Dr. C. H. Holmstrom, Warren, and Dr. John Cameron, Crookston, elected as alternate delegates. Dr. K. W. Kovey, Mahanomen, was elected censor for a three-year term.

WINONA COUNTY SOCIETY

Dr. Lewis I. Younger, Winona, has been elected president of the Winona County Medical Society to succeed Dr. S. J. Hamlon, St. Charles. Also elected to office at a recent meeting of the group was Dr. F. J. Vollmer, Winona, vice president, while Dr. Paul Heise and Dr. L. F. Johnston, both of Winona, were re-elected secretary and treasurer, respectively.

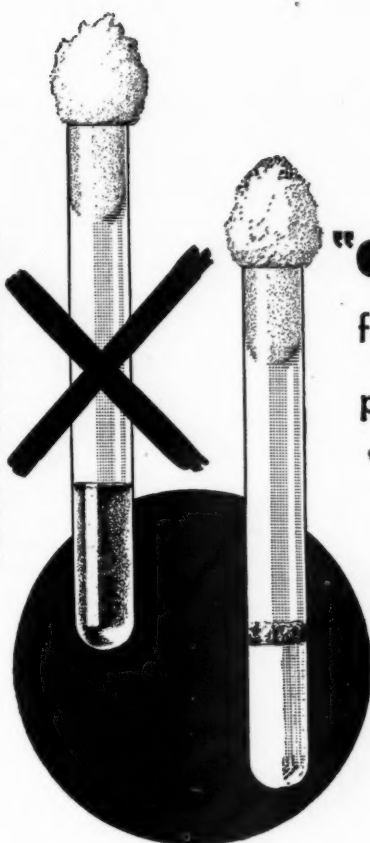
Re-elected as delegate to the state association was Dr. R. H. Wilson, Winona. Announcement was made that the Southern Minnesota Medical Association would hold its annual convention in Winona during August.

FREEBORN COUNTY SOCIETY

At the annual meeting of the Freeborn County Medical Society, held on December 17 at Hotel Albert in Albert Lea, Dr. Leo R. Prins was elected president of the organization. He succeeds the late Dr. Paul Gamble of Albert Lea.

Other officers elected at the meeting were Dr. J. P. Person, vice president; Dr. E. S. Palmerton, secretary, and Dr. R. A. Demo, treasurer, all of Albert Lea.

CONTAMINATION TEST of penicillin broth—one of the 138 separate tests carried out by Abbott in the production of dependable penicillin. Tubes of sterile nutrient are inoculated with samples of broth from the fermentation tanks and then incubated. Broth contaminated by bacteria turns cloudy; noncontaminated broth remains clear. Besides bacteria, other invaders to guard against are yeasts and wild molds. Some contaminants merely use up nutrients and reduce penicillin yield; others—such as the gram negative bacteria of the coliform group—produce penicillinase, which destroys the penicillin in the broth.



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WOMAN'S AUXILIARY

Blue Earth County

The Blue Earth County Auxiliary was hostess at a dinner meeting held at the Century Club, Mankato, on November 19, to the Nicollet-Le Sueur and Redwood-Brown Auxiliaries. Dr. Leonard Lange, obstetrician and gynecologist on the teaching staff of the University of Minnesota gave a talk to the doctors and their wives. About 100 attended. Mrs. A. A. Schmitz and Mrs. John Michelson were in charge of the social program. Mrs. W. W. Franchere is president of the Blue Earth Auxiliary.

Renville County

Renville County Auxiliary members were entertained at a Christmas party at the home of Dr. and Mrs. O. H. Johnson of Redwood Falls on December 9. Mrs. S. F. Cepelcha and Mrs. W. A. Brand assisted.

The Christmas seal essays were read and judged. Ruth Peterson of Sacred Heart received first prize of \$5.00; Larry Notman of Franklin, second prize of \$3.00, and Joan Benesh of Bird Island, third prize of \$2.00. Several more subscriptions to *Hygeia* were received.

Following an exchange of gifts, the physicians, together with their speaker of the evening, Dr. George

Agaard of Minneapolis, joined the Auxiliary members at the Johnson home and partook of a lunch of Christmas delicacies brought by several of the Auxiliary members.

On January 13, members of the Woman's Auxiliary to the Renville County Medical Society met for a 6:45 dinner at the Sweet Shop in Olivia. While the Doctors enjoyed a talk by a former member, Dr. W. Bushard of Edina, the Auxiliary members had a short business meeting. The rest of the evening was spent in preparing two scrapbooks. Members had brought cloth for pages and pictures. These scrapbooks were given to a hospital. All dues for the new year are in!

St. Louis County

The Woman's Auxiliary to the St. Louis County Medical Society held a meeting on January 13 at which Dr. F. S. Elias of Duluth, who is Council Chairman of the Minnesota State Medical Association, gave a talk on "Health Legislation."

The organization has a membership this year of 150 which includes forty members of the Range branch. They have planned a busy year. They are contributing to the Association for the Physically handicapped, Red Cross, Christmas Seals, Cancer Control, Society for the Prevention of Blindness. They help sponsor the Tuberculosis Essay Contest, camps for the Y.W.C.A. and Girl Scouts. They are also continuing their scholarship fund for nurses. To help them carry on this philanthropic and public health work, the members held a one-day rummage sale which netted over \$300.

Washington County

The Woman's Auxiliary to the Washington County Medical Society met at the home of Mrs. Demeter Kalinoff on December 9. This was a Christmas Party so a program was given and members exchanged gifts. They decided to send a gift to their shut-in member.

The Auxiliary met at the home of Mrs. Russell E. Carlson on Tuesday, January 13, for a dessert luncheon. Miss Maurine Erickson, County Social Worker, gave an interesting talk on her work.

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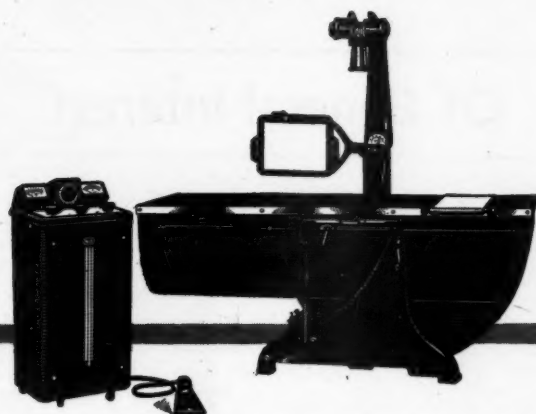
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◆ Of General Interest ◆

After March 15, Dr. S. T. Kucera of Lonsdale will be associated in practice with Dr. I. F. Seeley, with offices in the MacKay Building in Northfield.

* * *

In Clarissa on December 9, Dr. F. N. Grose became president of the Clarissa Commercial Club at the annual election of officers of the organization.

* * *

Principal speaker at a meeting of the Preston Parent-Teachers Association on December 17 was Dr. Maurice N. Walsh, Rochester.

* * *

An honorary award was presented to Dr. A. W. Graham, Chisholm, at the Tribute Night dinner held in Chisholm on December 15 by the American Legion drum corps.

* * *

A former resident of Sleepy Eye, Dr. L. F. Leitschuh, who has been practicing medicine in Oregon, in January began a fellowship at St. Mary's Hospital, Minneapolis.

* * *

Dr. Lawrence M. Larson, Minneapolis, has announced the association of Dr. John H. Rosenow in the practice of general surgery, with offices at 421 Medical Arts Building.

* * *

After completing an internship at Minneapolis General Hospital on January 1, Dr. Harold W. Hermann, formerly of Zumbro Falls, moved to Caledonia to open his medical practice.

* * *

"Recent Advances in Heart Disease" was the title of a talk given by Dr. Joseph F. Borg, Saint Paul, at a meeting January 15 of the Polk County (Wisconsin) Medical Society.

* * *

At the December meeting of the Range Medical Society, held in Chisholm on December 23, the principal speaker was Dr. Arthur H. Wells, pathologist of St. Luke's Hospital, Duluth.

* * *

A Commonwealth Fund fellowship was recently awarded to Dr. Edmund Flink, of the University of Minnesota Department of Medicine, to carry on a medical research project at Harvard University Medical School for one year starting September 1.

After a midwinter vacation with his parents in Mexico City, Dr. J. V. Wallinga, son of Dr. and Mrs. J. H. Wallinga, Saint Paul, has commenced his training in psychiatry at the Cleveland State Receiving Hospital.

* * *

"Common Skin Diseases" was the title of an address delivered by Dr. John F. Madden, Saint Paul, at a meeting of the Rice County Medical Society held in Faribault on February 3.

* * *

"Physiologic Principles in Aviation Medicine" was the title of a paper presented by Dr. J. H. Tillisch, Rochester, on January 5 in Cleveland, Ohio, at the meeting of the eighth annual Congress on Industrial Health of the American Medical Association.

* * *

Participating in a course at the University of Minnesota Center for Continuation Study, held during the week of January 5, Dr. George B. Eusterman, Rochester, presented a lecture entitled "Carcinoma of the Stomach."

* * *

Members of the Minnesota Society for the Study of Diseases of the Heart and Circulation, meeting in Duluth on December 13, heard Dr. H. L. Smith of Rochester speak on "The Incidence of Functional Diseases of Various Occupations."

* * *

In Havana, Cuba, early in January was Dr. L. W. Morsman, of the Morsman Clinic, Hibbing, attending the third session of the Pan-American Congress of Ophthalmology, the first meeting of the group since the start of World War II.

* * *

Among Minnesota physicians attending the annual meeting of the American Academy of Pediatrics in Dallas, Texas, early in December, were Dr. George Kimmel, Red Wing, and Dr. Roy N. Andrews, Mankato.

* * *

President-elect of the Stearns-Benton County Medical Society is Dr. L. M. Evans, Sauk Rapids, who was elected to office at a meeting of the society in December. President of the organization is Dr. A. H. Zachman, Melrose.

(Continued on Page 208)



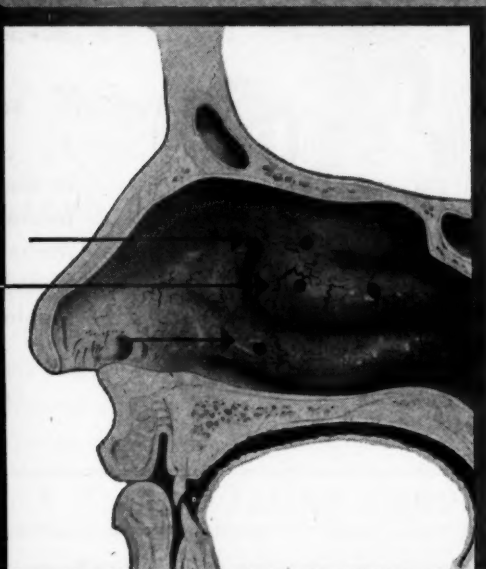
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- ORANGE, NEW JERSEY

(Continued from Page 206)

Principal speaker at a meeting of the Dakota County Branch of the Child Psychology Study Circle, held on January 13 in West Saint Paul, was Dr. Edward D. Anderson, Minneapolis. Dr. Anderson, a psychiatrist, spoke on "How Can We Attain Emotional Maturity?" A question and answer period followed his talk.

* * *

Two Minnesota physicians have been named to the Council of the National Committee for Mental Hygiene. They are Dr. E. Alan Challman, Minneapolis, president of the Minnesota Mental Hygiene Society, and Dr. Benjamin Spock, Rochester, child psychiatrist at the Mayo Clinic.

* * *

Executive director of the Minnesota Division, American Cancer Society, is Allan Stone, research director for Saint Paul's Wilder Charities. Announcement of his appointment was made in December by Dr. Arthur H. Wells, Duluth, acting director of the Minnesota cancer group.

* * *

At a meeting of the Southern Minnesota Spastic Club, held in Mankato on December 19, Dr. H. H. Russ, Blue Earth, spoke to parents of cerebral palsied children of the area on the problem of the cerebral palsied as the family physician sees it. After his address, Dr. Russ conducted a question and answer period.

* * *

After purchasing a two-story office building in Northfield, Dr. Joseph Belshe has commenced his practice in that city. A graduate of the University of Minnesota Medical School in 1945, Dr. Belshe served in the

army for twenty months at Lowry Field Station Hospital, Denver, Colorado.

* * *

After the city council in Stillwater reduced the salary of the city health officer from \$50 to \$25 a month, as part of an economy move, Dr. Russell E. Carlson announced his resignation as city health officer. He had been elected to the office a year earlier to succeed Dr. J. H. Haines, who had resigned.

* * *

Announcement has been made that Dr. Larry Swanson is now associated in practice with Doctors Lowe, Larson and Lowe, with offices at 158 North Concord Street, South Saint Paul. Dr. Swanson was graduated from the University of Minnesota Medical School in 1946 and served his internship at St. Joseph's Hospital, Saint Paul.

* * *

Now associated with Dr. Harold F. Flanagan in the practice of pediatrics, with offices at 868 Lowry Medical Arts Building, Saint Paul, is Dr. Edward F. Walsh. After graduating from the University of Minnesota in 1942, Dr. Walsh interned at Ancker Hospital, Saint Paul, served as a captain in the army, and then completed a residency at Minneapolis General Hospital.

* * *

New college office physician at Macalester College, Saint Paul, is Dr. William H. Watson, whose appointment to the position was announced on January 8. Formerly on the staff of St. Mary's Hospital, Minneapolis, Dr. Watson will maintain regular office hours on the Macalester campus. Continuing as consulting

(Continued on Page 210)

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ELKHART, INDIANA

(Continued from Page 208)

physicians at the college are Dr. Charles C. Cooper, Dr. E. J. Fogelberg, Dr. Robert K. Grau, and Dr. A. E. Ritt, all of Saint Paul.

* * *

It hardly seems necessary to warn the profession against the old swindle which has been revived by one Sr. Jose Cuito, in prison, so he says, in Mexico, and in need of several thousand dollars in order to obtain a trunk containing \$385,000 in U. S. currency. The recipient of his letter, which has been sent to a "sucker list" in this country, is promised a third of the sum for his participation.

* * *

Early in January, Dr. William O. McLane, who was affiliated with the Wadena Clinic for several months, announced that he was no longer associated with the clinic and was planning to build new offices for his practice in Wadena. Until his new offices were completed, he planned to conduct his practice from his home at 219 Second Street N. W. Dr. McLane specializes in diseases of the eye, ear, nose and throat.

* * *

Streptomycin was the subject of two talks given in the East during January by Dr. H. C. Hinshaw, Rochester. On January 8 he spoke at a meeting of the New York Academy of Medicine, in New York, on the topic, "Clinical Evaluation of Streptomycin Therapy in Tuberculosis and Other Infections." On the following day, speaking in Philadelphia at a meeting of the Eastern Section of the Trudeau Society, he discussed "Clinical Problems of Streptomycin Therapy."

* * *

Acting president of the Minnesota Division, American Cancer Society, Dr. Arthur H. Wells, Duluth, was recently elected a regional director on the national American Cancer Society board of directors. Representing Minnesota, Wisconsin, Michigan, Illinois, Indiana and Iowa on the national board, Dr. Wells succeeds the late Dr. William A. O'Brien, who was president of the state unit and regional ACS director at the time of his death.

* * *

Two out-of-state talks were given by Dr. Gordon R. Kamman, Saint Paul, during the month of January. In Milwaukee, Wisconsin, on January 9, Dr. Kamman spoke before the Milwaukee County Medical Society on "The Psychobiologic Basis for the Psychosomatic Concept." In Minot, North Dakota, on January 21, his subject was "Neurotic Problems Confronting the General Practitioner" when he spoke at a meeting of the Northwest District Medical Society.

* * *

A campaign was launched in Albert Lea in December to raise funds to establish a well-equipped children's ward in Naeve Hospital in memory of three brothers who lived, practiced medicine, and died in Albert Lea.

Backing the memorial campaign were friends and admirers of the late Doctors Will, Ross and Paul Gamble. Eldest of the three brothers, Dr. Will Gamble, began his practice in Albert Lea early in the

MINNESOTA MEDICINE

OF GENERAL INTEREST

1920's and was joined there soon afterwards by his brothers. Dr. Ross Gamble died several years ago; both Dr. Paul Gamble and Dr. Will Gamble died during the summer of 1947.

* * *

Offices for the practice of internal medicine have been opened by Dr. Eugene Rinkey at 749 Lowry Medical Arts Building, Saint Paul. A graduate of the University of Minnesota Medical School in 1940, Dr. Rinkey interned at St. Mary's Hospital, Minneapolis. After practicing at Redwood Falls for a year, he served in the army from 1942 until 1945 when he was discharged as a captain. During the past year Dr. Rinkey was a resident at Ancker Hospital, Saint Paul.

* * *

Three formerly separate sections of the army medical department were recently combined into a single unit under the command of a former Mankato woman. Chief of the new women's medical specialist corps, which now includes the dietitian section, the physical therapist section, and the occupational therapist section of the army medical department, is Colonel Emma E. Vogel, a former resident of Mankato, regarded by the surgeon general's office as the nation's outstanding physical therapist.

* * *

Under the direction of Dr. Walter A. Fansler, clinical assistant professor of surgery at the University of Minnesota, a continuation course in proctology as held in Minneapolis during the week of February 2 to 7. The course consisted of lectures at the University's Center for Continuation Study and clinics at Minneapolis General Hospital and Fort Snelling Veterans Hospital. Guest lecturer for the one-week course was Dr. Harry E. Bacon, head of the Department of Proctology at Temple University Medical School.

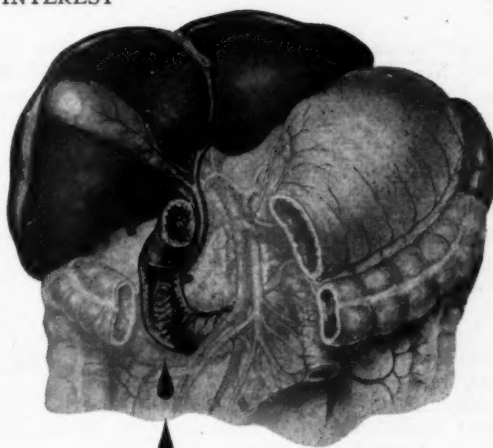
* * *

The Mississippi Valley Medical Editors Association is considering changing its name at its meeting next fall to the Mississippi Valley Medical Writers Association. It is pointed out that whereas all medical editors are writers, all medical writers are not editors, and since one of the principal purposes of the association is the improvement of medical writing, the change seems desirable. That the change in name will be made seems a foregone conclusion. Interested medical writers should contact Dr. Harold Swanberg, Secretary, 209 W. C. U. Building, Quincy, Illinois.

* * *

Dr. Lawrence W. Rember has been appointed executive assistant to Dr. George F. Lull, secretary and general manager of the AMA. Dr. Rember will be in charge of public relations, a task for which he is well qualified, having been director of public relations for the Blue Cross Plan Commission of the American Hospital Association and public relations director of the seventeen-state midwestern area of the American National Red Cross. He received an M.A. degree in journalism from Northwestern University after obtaining his B.A. degree at the University of Wisconsin, where he majored in journalism and commerce.

FEBRUARY, 1948



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*Albrecht, F. K.: Modern Management in Clinical Medicine, Baltimore, The Williams and Wilkins Co., 1946, p. 170.



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ELKHART, INDIANA

OF GENERAL INTEREST

Staff members of St. Luke's Hospital, Duluth, at their November meeting heard Dr. Richard Varco, of the Department of Surgery of the University of Minnesota, speak on "The Surgical Treatment of Certain Congenital Defects of the Heart and Great Vessels."

At the December meeting of the staff, papers were presented by Dr. S. H. Boyer, Jr., Dr. E. I. Parson, and Dr. J. J. Coll, all of Duluth. The January staff meeting had as the principal speaker, Mr. James Hamilton, of the Department of Hospital Administration, University of Minnesota.

* * *

Two new appointments were made in January by the Minneapolis City Health Department. Miss Helen Hestad, former assistant director of Minneapolis Community Health Service, was appointed Maternal and Child Health Nursing Consultant in the Bureau of Public Health Nursing. Mrs. Grace Henshaw Babcock, formerly with the American Red Cross and voluntary public health nursing agencies in Minneapolis, was appointed Mental Hygiene Consultant, a newly created position in the Bureau of Public Health Nursing. The two appointments were made possible by maternal and child health funds from the Minnesota Department of Health.

* * *

Dr. Edgar V. Allen, who has been with the Mayo Clinic since 1930 and chief of a section in internal medicine since 1936, has been appointed chief of the Division of Internal Medicine at the Cleveland Clinic, a nonprofit institution, second largest of its type in the

United States. Dr. Allen was graduated from the University of Nebraska in 1925; he obtained an M.S. degree from the University of Minnesota in 1932. During 1929 and 1930 he studied in Germany and England on a fellowship from the National Research Council. In World War II he served as a colonel in the medical corps of the army and was consultant in medicine for the Seventh Service Command.

* * *

After more than fifty years of practice in Fergus Falls, Dr. W. W. Drought is closing his office. Dr. Drought began his medical practice in Fergus Falls in partnership with Dr. A. B. Cole, one time state senator from Otter Tail County. Later, Doctors Cole and Drought were affiliated with a Dr. Kittelson, with offices in the First National Bank Building in Fergus Falls. Dr. Kittelson later withdrew from the group to open an individual practice. After the death of Dr. Cole, many years ago, Dr. Drought maintained the practice by himself.

* * *

The Lyon-Lincoln County Medical Society recently completed its thirty-sixth semi-annual postgraduate extension course. Initiated following World War I, each course has consisted of four to six meetings held on consecutive Tuesday evenings, with addresses by outside or local physicians. During World War II, recourse was had to medical motion pictures, which have proven valuable in the educational field. With a society membership of only twenty-one, the attendance at the

(Continued on Page 214)



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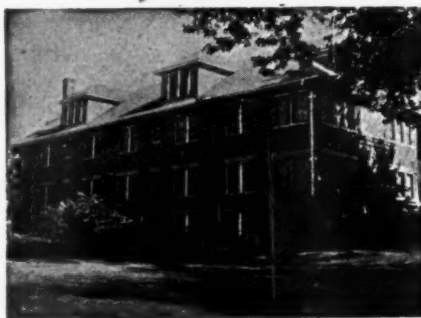
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Winona

OF GENERAL INTEREST

(Continued from Page 212)

dinner meetings has been as high as fifty-four. The society is to be congratulated on its accomplishment, which, as far as is known, is unique in the territory outside the large cities of the state.

* * *

Popular response to a talk given before the Winona Kiwanis Club in August, 1947, brought Dr. Benjamin Spock, Rochester, back to Winona on February 3 as principal speaker at the Council Founders' Day program of the Winona City Parent-Teacher Association. After hearing Dr. Spock at the Kiwanis Club meeting speak on "How Grandpa Should Talk to His Grandchildren," residents of Winona urged that the Mayo Clinic child health authority be brought back to the city for another talk. Dr. Spock complied, and at the PTA meeting in February he presented the subject, "The School-Age Child."

* * *

Christmas was merrier for children in Red Wing this last season because of Dr. L. E. Claydon's ingenuity in constructing outdoor decorations.

On the porch of his home, in a setting of lighted fir trees and holly, the Red Wing physician installed a life-size figure of Santa Claus seated before a model pipe organ. Records of organ music could be "piped" from the house to the porch, and a concealed cord led from Santa into the house. As children would pass by in the evening, Dr. Claydon would turn on the music and start manipulating the cord—and Santa would nod and

sway over the keyboard, playing joyous Christmas carols. The children loved it, many of them climbing onto the porch to give Santa a hug and a kiss—a satisfying reward to Dr. Claydon, who brought Santa to life in Red Wing.

* * *

The annual gold medal award for the outstanding "family doctor" was presented this year to Dr. Archer C. Sudan, a Colorado physician, by the AMA House of Delegates while assembled in Cleveland in January.

The names of several hundred general practitioners had been submitted to the AMA by medical and non-medical groups. Three names were voted upon by the House of Delegates—Dr. A. C. Sudan, Kremmling, Colorado; Dr. W. L. Presley, Due West, South Carolina, and Dr. Jacob T. Oliphant, Farmersburg, Indiana.

Dr. Sudan, a native of Sioux Falls, South Dakota, left the University of Chicago Medical School in 1926, where he was a teacher and research worker, to locate in a mountain district of Colorado where he had recognized the urgent need for a physician while on a fishing trip. He has just completed a term as president of the Colorado State Medical Association.

* * *

Le Sueur acquired a new physician on January 5 with the arrival in the city of Raymond Rowberg, formerly of Minneapolis. A graduate of the University of Minnesota Medical School, Dr. Rowberg is associated in practice with Dr. S. Ericson of Le Sueur.



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MAY RESEARCH

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On January 1 it was announced in Ortonville that Dr. Clarence S. Youngstrom, of La Crosse, Wisconsin, was joining the staff of the Ortonville Clinic where he would be associated in practice with Dr. D. M. O'Donnell and Dr. J. F. Karn.

A graduate of the University of Nebraska in 1938, Dr. Youngstrom interned at the U. S. Marine Hospital in Seattle, Washington, later completed residencies at the University of Wisconsin General Hospital, at Milwaukee Children's Hospital and at Henry Ford Hospital in Detroit, Michigan. He spent one year in industrial surgery and another year on a fellowship in surgery at the Gunderson Clinic in La Crosse, Wisconsin.

* * *

A complimentary dinner at the Minnesota Club on January 19 was tendered Dr. Alexander R. Colvin, Saint Paul, by the surgical staff of Ancker Hospital. A graduate of McGill University Medical School in 1894, Dr. Colvin settled in Saint Paul in 1903 after studying in various European medical centers. He has practiced in Saint Paul continuously since that year, except for his service as a major in the medical corps of the army during World War I. He has been associated with Ancker Hospital since his arrival in Saint Paul, and for the past thirty years has headed the surgical service of the institution.

In his remarks following the dinner, Dr. Colvin urged his audience to re-read the great classics in medical literature and emphasized that all sciences are closely intertwined. He commended the attitude of the Welfare Board in not interfering with the medical

work of Ancker Hospital. Stating that the hospital's medical staff ranks with the best in the nation, he said that the institution offers a great field for clinical and pathological study and investigation by young physicians.

* * *

Preliminary results of a survey recently conducted by three Minnesota health agencies indicated an enthusiastic interest in the problem of cancer control by Minnesota's practicing physicians.

Conducted by the Division of Cancer Control of the Minnesota Department of Health, the Cancer Committee of the Minnesota State Medical Association, and the state division of the American Cancer Society, the survey showed that (1) most physicians are in favor of a "back to school" movement with expanded continuation courses on cancer research, diagnosis and treatment; (2) half of the physicians who answered the survey advocate a free correspondence consultation service on cancer cases, and (3) two out of three physicians believe in hiring qualified medical men on a full-time basis to travel throughout the state, giving talks on cancer to hospital staffs and local medical societies.

The survey was believed to be the first of its kind on a state-wide basis to ascertain just what practicing physicians and surgeons feel are the best means of fighting the disease. The numerical response to the survey far exceeded expectations.

* * *

Minnesota's candidate for the title of the nation's outstanding "family doctor" was Dr. William W. Will, who has devoted the forty-one years since his intern-

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ship to a town of 550 persons, the community of Bertha.

From numerous candidates throughout the state, Dr. Will was selected as Minnesota's nomination for the AMA gold medal award and his name was presented to the AMA House of Delegates with the backing of the Minnesota State Medical Association.

A graduate of the University of Minnesota Medical School in 1905, Dr. Will began his practice in Bertha immediately after completing his internship. During his forty-one years of practice in the city and the surrounding area, the sixty-eight-year-old physician has attended more than 4,000 births; in September, 1946, many of these "babies" returned to the city to join in a community-wide tribute to Dr. Will.

President of the Minnesota State Medical Association in 1936, Dr. Will is still active in medical and civic affairs. At the present time, in addition to conducting his medical practice, he is president of the Bertha Commercial Club, is busy in Todd County political circles, and is prominent in church work.

* * *

At the annual meeting of the American Academy of Orthopaedic Surgeons, held in Chicago on January 27, Dr. Vernon L. Hart, Minneapolis, presented a paper on "Relationship Between Congenital Subluxation and Congenital Dislocation of the Hip." In association with Dr. Wesley H. Burnham, Minneapolis, Dr. Hart also presented the same subject in an exhibit which was awarded second honors.

* * *

Dr. Henry Michelson, Minneapolis, has been invited to be guest of honor at the annual meeting of the California State Medical Society, to be held in San Francisco in April. Dr. Michelson will discuss cutaneous cancer before the general assembly and will describe the lupus erythematosus problem before the dermatological section.

Dr. Michelson has also been invited to present the postgraduate lectures in dermatology at the University of British Columbia in Vancouver in June.

* * *

Listing of blood types of 2,500 volunteer blood donors among residents of Minneapolis suburban areas was slated to start in Wayzata in late February. Communities taking part in the project, which is sponsored by the Ernest Asleton American Legion Post of Wayzata, are Wayzata, Deephaven, Long Lake and Minnetonka Beach. Plans called for a blood typing center in the Wayzata Legion hall, handling 200 persons a night. The completed listing would enable Minneapolis hospitals to know exactly whom to call to get specific blood type replacements. It was planned to give master donor lists to all major Minneapolis hospitals, physicians' offices, town halls and servicemen's clubs.

HOSPITAL NEWS

New staff officers were elected at meetings held during December and January by the staff members of the following Minnesota hospitals:

Miller Memorial Hospital, Duluth.—At the annual meeting of the medical staff of Miller Memorial Hospital on January 9, Dr. Keith R. Fawcett was elected chief of staff, succeeding Dr. A. J. Spang. Elected

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vice chief was Dr. Karl E. Johnson, while Dr. M. G. Fredricks was named secretary. Executive committee members named at the meeting were Dr. Spang, Dr. E. E. Barrett and Dr. Mario Fischer.

Asbury Hospital, Minneapolis.—Dr. Charles H. McKenzie was elected president of the Asbury Hospital medical staff at the annual meeting held late in December. Other staff officers named were Dr. Ann W. Arnold, vice president; Dr. Wayne S. Hagen, secretary and treasurer, and Dr. C. A. McKinlay, advisory board member. Also on the board are Dr. H. E. Hoffert, Dr. Ernest R. Anderson and Dr. R. R. Cranmer.

St. Cloud Hospital, St. Cloud.—Elected president of the medical staff of St. Cloud Hospital was Dr. P. L. Halenbeck, who was named to the office at an election meeting held early in December. Also elected to office were Dr. C. J. Luckemeyer, vice president, and Dr. N. F. Musachio, of Foley, secretary.

St. Joseph's Hospital, Mankato.—New head of St. Joseph's Hospital staff is Dr. H. J. Nilson, who was elected president at the annual meeting of the staff on December 11. Dr. O. H. Jones was named vice president, and Dr. A. A. Giroux, secretary-treasurer. Appointed to the executive board were Dr. A. V. Sommer, Dr. J. A. Butzer and Dr. Bradley Troost.

Loretto Hospital, New Ulm.—Dr. O. B. Fesenmaier was elected president of the Loretto Hospital staff at a meeting held on January 8. Also named to office were Dr. O. J. Seifert, vice president, and Dr. William Black, secretary.

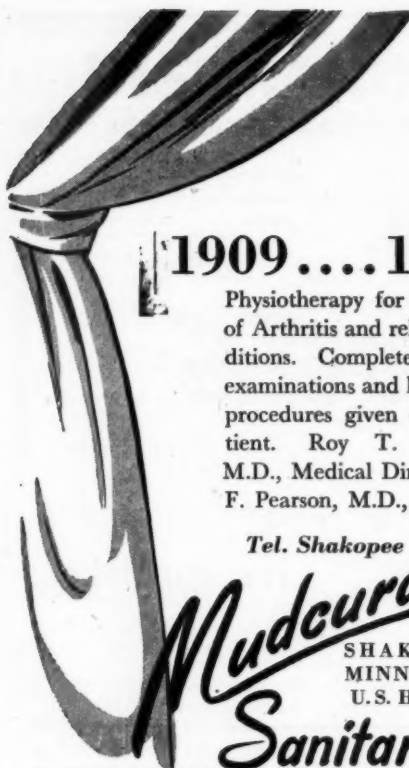
Union Hospital, New Ulm.—President of the Union Hospital staff is Dr. O. J. Seifert, who was elected to office at a meeting held on January 8. Dr. Carl Fritsche was named vice president of the staff, and Dr. Ted Fritsche, secretary.

St. Joseph's Hospital, Brainerd.—At a meeting on January 8, Dr. W. E. Fitzsimons was named chief of staff of St. Joseph's Hospital, to succeed Dr. J. A. Thabes, Sr. Also elected to office were Dr. G. E. Cardle, vice chief of staff, succeeding Dr. R. A. Beise, and Dr. A. M. Mulligan, secretary-treasurer, succeeding Dr. Fitzsimons.

St. Mary's Hospital, Minneapolis.—Dr. F. B. Mach was elected president of the advisory board of St. Mary's Hospital at the board's annual meeting early in January. Named as vice president was Dr. Leo Culligan, while Dr. L. J. Happe was elected secretary. New members elected to the board were Dr. James Hayes and Dr. Horatio Sweetser.

* * *

Early in December a delegation from the Madison Hospital Association conferred in Saint Paul with Dr. Viktor O. Wilson, chief of the Section on Special Services in the Minnesota Department of Health, in an effort to determine whether the hospital-building project in Madison could qualify for aid from Federal funds. It was decided to make a careful survey of the proposed Madison Hospital territory and to send a request to the Health Department for an engineer to make an examination of possible hospital sites.



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Included in the recently released 1947 listing of courses approved by the American Dietetic Association is the dietetic internship at the University of Minnesota Hospitals.

The dietetic internship at the University offers supervised application of college training in dietetics. All interns accepted for training are graduates of accredited colleges or universities, with majors in food and nutrition or institution management. The satisfactory completion of a year of postgraduate training in such an approved internship qualifies the student for a position as a hospital dietitian anywhere in the country.

* * *

A continuation course in hospital administration was presented during the week of February 2 to 7 at the University of Minnesota Center for Continuation Study. Co-operating with the University in offering the course were the Minnesota Hospital Association and the American College of Hospital Administrators of Chicago.

The course was divided into two three-day sessions. In charge of the first session, on "Operating Statistical and Accounting Control," was James A. Hamilton, professor of hospital administration. The second session, on "Standards and Methods of Plant Maintenance," was under the direction of James W. Stephan, associate professor of hospital administration.

On the afternoon of February 4, a special general session was given over to a consideration of the survey and construction act, both from the state and national points of view.



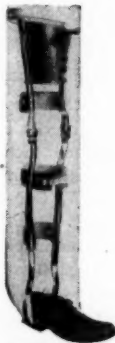
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Books listed here become the property of the Ramsey, Hennepin and St. Louis County Medical Libraries when reviewed. Members, however, are urged to write reviews of any or every recent book which may be of interest to physicians.

140 MILLION PATIENTS. Carl Malmberg. 242 pages. Price, \$2.75, cloth. New York: Reynal & Hitchcock, 1947.

MINOR SURGERY. Sixth Edition. Frederick Christopher, B.S., M.D., F.A.C.S. Associate Professor of Surgery, Northwestern University Medical School; Chief Surgeon, Evanston (Illinois) Hospital. 1058 pages. Illus. Price, \$12.00, cloth. Philadelphia: W. B. Saunders Co., 1948.

MANUAL OF CLINICAL THERAPEUTICS. A Guide for Students and Practitioners. Second Edition. Windsor C. Cutting, M.D. Professor of Therapeutics, Stanford University School of Medicine, San Francisco. 712 pages. Illus. Price, \$5.00, flexible binding. Philadelphia: W. B. Saunders Co., 1948.

A MANUAL OF PHARMACOLOGY, AND ITS APPLICATION TO THERAPEUTICS AND TOXICOLOGY. Seventh Edition. Torald Sollman, M.D., Professor Emeritus of Pharmacology and Materia Medica, School of Medicine, Western Reserve University, Cleveland. 1132 pages. Price \$11.50, cloth. Philadelphia: W. B. Saunders Co., 1948.

A TEXTBOOK OF PATHOLOGY. Fifth Edition. William Boyd, M.D. Dipl. Psych., M.R.C.P. Edin., F.R.C.P. Lond., L.L.D. Sask., M.D., Oslo, F.R.C.S. Professor of Pathology and Bacteriology of the University of Toronto. 1049 pages. Illus. Price \$10.00, cloth. Philadelphia: Lea & Febiger, 1947.

APPLIED MEDICAL BACTERIOLOGY. Max S. Marshall, Ph.D. With collaboration of Janet B. Gunnison, M.A., Alfred S. Lazarus, Ph. D., Elizabeth L. Morrison, M.A., and Marian C. Shevsky, A.B. Division of Bacteriology, Medical Center of University of California, San Francisco. 340 pages. Illus. Price \$4.50, cloth. Philadelphia: Lea & Febiger, 1947.

TUBERCULOSIS. A Discussion of Phthisiogenesis, Immunology, Pathologic Physiology, Diagnosis and Treatment. Francis Marion Pottenger, A.M., M.D., L.L.D., F.A.C.P. Emeritus Professor of Medicine, University of Southern California School of Medicine; Medical Director Pottenger Sanatorium and Clinic for Diseases of the Chest, Monrovia, California. 597 pages. Illus. Price \$12.00, cloth. St. Louis: C. V. Mosby Co., 1948.

HERNIA. Anatomy, Etiology, Symptoms, Diagnosis, Differential Diagnosis, Prognosis and Treatment. Third Edition. Leigh F. Watson, M.D., F.I.C.S. Certified by the International Board of Surgery; Formerly Associate in Surgery, Rush Medical College, Chicago; Formerly Assistant Professor of Surgery, University of Oklahoma Medical School, Oklahoma City. 732 pages. Illus. Price \$13.50, cloth. St. Louis: C. V. Mosby Co., 1948.

OCCUPATIONAL MEDICINE AND INDUSTRIAL HYGIENE. Rutherford T. Johnstone, A.B., M.D. Consultant in Industrial Health; Lecturer at the University of California, Los Angeles; Formerly Assistant Professor of Medicine, University of Pittsburgh School of Medicine; Formerly Director of Department of Occupational Diseases, Golden State Hospital. 604 pages. Illus. Price \$10.00, cloth. St. Louis: C. V. Mosby Co., 1948.

ADVANCES IN MILITARY MEDICINE. Made by American Investigators Working Under the Sponsorship of the Committee on Medical Research. Edited by E. C. Andrus, D. W. Bronk, G. A. Carden, Jr., C. S. Keefer, J. S. Lockwood, J. T. Wearn and M. C. Winternitz; Associate editor Tuckerman Day. 900 pages. Illus. Price \$12.50, 2 vols., cloth. Boston: Atlantic Monthly Press, Little, Brown & Co., 1948.

SEXUAL BEHAVIOR IN THE HUMAN MALE. A. C. Kinsey, Professor of Zoology, Indiana University; W. B. Pomeroy, Research Associate, and C. E. Martin, Research Associate. 804 pages. Illus. Price \$6.50. Philadelphia: W. B. Saunders Co., 1948.

Even without its well-conducted publicity campaign, this book would be a best seller, because of its title. To compare it to James Thurber's "Is Sex Necessary?"—or call it the medical "Forever Amber" is unfair, as the authors have done a magnificent job in assembling statistical data regarding the sex practices in the human

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BOOK REVIEWS

male. The subject has been approached in a frank, honest, intelligent manner. While the subject matter will not be shocking to the physician, the high incidence of the various unconventional sexual practices as reported in this study may be astounding even to him. The authors draw their conclusions from the study of 12,000 interviews. When one realizes how far off the *Literary Digest* was several years ago in picking the winner of a Presidential poll, one may hesitate to put implicit trust in such statistical studies. Also, it is not clear in some instances at what time of life these sexual aberrations took place. Such practices in childhood would have different significance, both moral and physical, as compared to those in adults. Another weakness is the tendency of the authors to rationalize about the statistical data.

As the authors state "The social values of human activities must be measured by many scales other than those which are available to the scientist. Individual responsibilities toward others in the social organization, and the long-range outcome of behavior which represents the individual's response to the stimuli of the immediate moment, are things that persons other than scientists must evaluate. As scientists, we have explored, and we have performed our function when we have published the record of what we have found the human male doing sexually, as far as we have been able to ascertain that fact."

Numerous charts and tables are included in the book. The subject matter is of particular interest to sociologists, psychiatrists and the urologists. All in all, the authors have done an excellent job with a difficult subject.

CHARLES E. REA, M.D.

A PRIMER OF CARDIOLOGY. George E. Burch, M.D., F.A.C.P., Associate Professor of Medicine, Tulane University School of Medicine; Senior Visiting Physician, Charity Hospital; Consultant in Cardiovascular Diseases, Ochsner Clinic; Visiting Physician, Touro Infirmary, New Orleans; and Paul Reasor, M.D., Instructor in Medicine, Tulane University School of Medicine; Assistant Visiting Physician, Charity Hospital, New Orleans. 272 pages. 203 illus. Price \$4.50. Philadelphia: Lea & Febiger, 1947.

"A Primer of Cardiology" deals chiefly with the physical diagnosis of heart disease with the subjects of etiology and treatment being outlined only briefly.

Visual education is used and perfected to a high degree. The hemodynamics of normal and abnormal heart sounds are illustrated diagrammatically. The timing of the heart sounds and murmurs are visualized by super-

imposed tracings of carotid pulse wave, venous pulse wave, electrocardiogram and phonogram tracings.

This book is highly recommended for the student and as a refresher in physical diagnosis.

BURTIS J. MEARS, M.D.

THE OCULOROTARY MUSCLES. Richard G. Scobee, B.A., M.D.; Instructor in Ophthalmology, Washington University School of Medicine, St. Louis, Mo. 359 Pages. Illus. Price \$8.00. St. Louis: C. V. Mosby Co., 1947.

The author has taken a difficult subject and has covered the field from various angles, preferring to divide the work into five headings and then dividing the whole into twenty-nine chapters. This, at first glance, seems to complicate an already complex subject, but it works out well in the text and when once gone over makes it more satisfactory for subsequent reference.

The author states in his preface that he has adhered to the theory of Chavasse that a paretic muscle will generally regain more of its tonus if its antagonist is weakened, rather than to shorten the paretic muscle, and that the physiological results are improved.

The text has many excerpts and illustrations from current works on ophthalmology. Some chapters seem to have been treated briefly, but in the space of three hundred and fifty pages it would be burdensome to give a more full account, as it would defeat the object of the book.

Bibliographic references follow each chapter and give a ready reference to the specific subject treated in each chapter.

This work represents Dr. Scobee's point of view on the oculorotary muscles. When a man has spent as much time and patience in a difficult field, his viewpoint is worthy of careful attention to those who would be best benefited by a better knowledge of ophthalmology.

J. C. B.

COMMUNICABLE DISEASES. Franklin H. Top, A.B., M.D., M.P.H., F.A.C.P., Medical Director, Herman Kiefer Hospital; Clinical Professor of Preventive Medicine and Public Health, Wayne University College of Medicine; Extramural Lecturer in Infectious Diseases and Epidemiology, School of Public Health, University of Michigan; Consultant, Preventive Medicine Section, Surgeon General's Office, United States Army; and others. 992 pages. Illus. Price \$8.50. St. Louis: C. V. Mosby Co., 1947.

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